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Effect of Corrective Exercises by an Innovative Device According to Some Biomechanical Variables in the Thrust of the Aiming Arm and the Accuracy of the Free Throw Correction for Basketball Players

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Abstract

Through the researchers' interest in the basketball game and the continuous follow-up of the matches of the Iraqi club championships, the researcher found that there is a problem embodied about the poor accuracy of shooting from the free throw from a distance (225.4 m) from the free throw line to the center of the throat, and the researchers attribute the reason for this to the lack of use innovative and modern devices and tools and the optimal use of laws and biomechanical foundations and their investment in discovering the strengths and weaknesses of the aiming arm, especially the fingers pointing to the ball to improve the free throw shooting of basketball at ages (under 18 years) in addition to the presence of some technical errors associated with the performance of the skill, therefore, the researchers decided to study free throwing in basketball and diagnose technical errors in the biomechanical variables (kantec) of the movement of the arm and the fingers of the aiming hand at the moment of the exit of the ball in the research sample through the creation of a palm device to measure the compressive force from the fingers of the hand to the arm aiming the ball, and the development of corrective exercises in light the biomechanical variables to improve the level of performance of this skill and the precise mechanical details and knowledge of its causes are what lead to the improvement of this skill and it is an important and necessary requirement to acquire the correct kinematic course and ideal accuracy in hitting the ball in the throat of the basket to achieve the best performance.

The study also aimed to: Creating a device to measure the strength and time of the aiming arm while aiming with a basketball, as well as identifying the biomechanical variables of the shooting skill in the free throw of basketball players, and the development of corrective exercises according to some biomechanical variables for the skill of correction, the free throw of the basketball.

The researchers also used the experimental method, and the research experiment was conducted on a community of young players of (under 18) years of age for the basketball club Hilla with a sample (n = 5) and the researcher gave each player (10) attempts to shoot with a free throw from a distance of (4.225 m) consequently, the total attempts are (50) attempts in the pre-test. The exercises lasted (6) weeks, at an average of (4) units per week using the interval training method, and the corrective unit time was (35%) from the beginning of the main part assigned by the team coach.

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Introduction:

The continuous scientific development of all different sciences has brought about many changes in the various lifestyles, and sports training is one of the most important areas that scientists have been interested in, which helped discover many scientific methods to help coaches and athletes in all sporting events in raising their achievements, including the game of basketball, and for this we note that there are amazing achievements that have taken place in the game of basketball at the Arab, Asian and international levels through the use of modern training methods, the coaches choose appropriate exercises in a scientific way within the training curricula of their athletes, which helps in raising their achievements, in this progress, it is necessary to take a deep look at the skill level of the player during matches in the basketball game to know the level of performance of the players inside the matches for basic skills, and among these skills is the shooting in the free throw, because of this skill of great influence and a major in scoring points and resolving matches and winning the result.

In the field of studying and analyzing sports movements, we find that biomechanics is at the forefront in uncovering many important and reliable cases in explaining each stage of movement performance in many different sports, where it can be delved into, including basketball, especially the skill of shooting in free throw and study the variables of this skill with high accuracy so that a lot of analytical studies are required for each stage related to its technical performance or what is resulting from it, as it requires advanced kinematic imaging and analysis to know the biomechanical indicators of the performance of this skill, its shape, and its correct movement path, applying the foundations and mechanical laws, investing them in the optimal technical form and method and comparing them with the calculated equation for this skill to reach the players to the highest levels.

Hence the importance of the research in studying the factors and influences of biomechanical skill performance by setting corrective exercises in light of biomechanical variables to correct and improve correction in the free throw of basketball, and within a program of kinematic analysis in order to achieve optimal performance in matches.

Research problem:

The researchers decided to study free throwing in basketball and diagnose technical errors in the biomechanical variables (kantec) of the movement of the arm and the fingers of the aiming hand at the moment of the exit of the ball in the research sample by creating a palm device to measure the compressive force from the fingers of the hand to the arm that aims the ball, and setting corrective exercises in light of the biomechanical variables to improve the level of performance of this skill, and that the precise mechanical details and knowledge of its causes lead to the improvement of this skill and is an important and necessary requirement to acquire the correct movement path and the ideal accuracy in hitting the ball in the throat of the basket to achieve the best performance.

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Research objectives:

- Innovative a device to measure the strength and time of the aiming arm while aiming with a basketball.
- Knowing the biomechanical variables of the shooting skill in the free throw of basketball players.
- Developing corrective exercises according to some biomechanical variables for the skill of correction free throw with basketball.
- Knowing the effect of corrective exercises on biomechanical variables and the accuracy of free throw shooting for basketball players.

Research hypotheses :

- Special exercises have a positive effect on the most important biomechanical variables of the arm and fingers used for the shooting skill in the free throw of the basketball players.
- There is a positive effect of corrective exercises in improving the biomechanical variables of shooting skill in the free throw of basketball players.

Research methodology and field procedures:

Research Methodology:

The researchers used the experimental method, which is one group and that (pre-test, post-test).

Research community and sample:

The research community was determined with the young basketball players of the Al Hilla Sports Club basketball by (12) players for the age stage below 18 years, for the season 2021-2020, the research sample, which was chosen by the random method, "which is from non-random samples that is chosen on a free basis by the researcher and according to the nature of his research, which fulfills the purposes of his study" [(1)], included the youth players of Hilla Sports Club of ages (under 18 years) and adults. Their number is (10) players, noting that this team is one of the best clubs in Iraq, with a percentage of (83.3) as this percentage represented a true representation of the research sample.

Tools and methods used in the research:

Methods for gathering information:

- Note.
- Questionnaire.
- Tests, measurement and topography.
- Personal interviews

Devices and tools used in the research:

- (3) cameras: a Japanese-made Casio camera (a high-frequency camera that is set at a speed of 300 images / s) to photograph the ball's trajectory, a Chinese-made Xiaomi mobile camera for photographing educational units.
- Tripod camera holder, count (2).
- External memory (Ram), count (2).
- Adhesive tapes, measuring tapes, phosphorescent markers for biomechanical analysis.
- A mobile personal calculator, type (DELL), made in Malaysia.

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- 10 basketballs.
- Medical balance.
- The biomechanical analysis program (Tracker).
- Microsoft Excel.
- Made-to-measure palm device for measuring force.

Field research procedures:

Description of the skill performance test for free throw basketball scoring skill:

The technical performance of the free-throw scoring skill with basketball is represented by the performance of the skill, and according to the legal conditions of the game, as the members of the sample perform (10) attempts for each player from a distance of (4.225 m) a shot.

The aim of the test:

- Measurement of the force exerted on the ball by the fingers of the hand of the aiming arm with an innovative device to determine the weak points of the aiming arm.
- Filming (10) attempts to perform the skill of free-throw scoring with basketball and each player and analyzing it kinematic, with the purpose of diagnosing errors and then preparing corrective exercises to address them.

Tools: a legal basketball court, legal basketball balls, video cameras, a whistle, an innovative force measuring device.

Performance description: The tested player performs the skill with the free throw, and from the legal distance of the free throw (4.225) m, within the specified area for the player's free throw of a basketball.

Design and preparation of devices and tools:

The researchers have the idea of manufacturing a device that measures the force exerted on the ball from the five fingers of the research sample after the researcher noticed that there is a big difference between the fingers applying force to the ball without following the fingers, especially the index finger of the ball when it comes out of the player's hand, thus this leads to the ball not being directed With the correct path as well as not spinning around itself, therefore, the researchers cooperated with the supervisor to design this device, which would contribute to measuring the final force imposed by the fingers of the hand on the ball during the performance of the final stage of correction, noting that there is no similar device manufactured for basketball.

This device was designed according to the biomechanical variables (kontak) that appeared through the variables of the aiming arm and it has a great role in measuring the force exerted by each finger on the ball in the free throw, which had an important role in measuring the force of the aiming arm through the method of work of this device, which starts the moment of exit the ball from the fingertips, as for the manufacturing materials of this device, they are (2 Arduino device, 5 power sensors, 1 m long connecting wire, 2 bluetooth, a cloth palm, a DELL calculator, a small size battery (5VOLT). After manufacturing the device to measure the force.

Exploratory experience:

The researchers conducted the pilot experiment on Wednesday, 23/12/2020 at two o'clock in the evening in the gymnasium of the National Center for Gifted Sports in Babylon. On a group of the research sample consisting of (5) players from the research sample, the researchers photographed the performance of the free throw skill with basketball and from the free throw

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area, and then analyzed the filming results in the second exploratory experiment and through an advanced analysis program (Tracker) and the researcher came out with the following points: -

- Innovative a device to measure some of the biomechanical variables in the thrust of the aiming arm and the accuracy of the free throw correction of basketball players.
- Calculation of the force exerted on the ball by the fingertips of the aiming arm.

Pre-test:

The researchers conducted the pretest on all the members of the research sample from the players (the experimental group), and for all research variables from biomechanical indicators and the skill of free throwing basketball on Sunday 28/12/2020 at two o'clock in the evening, the pre-test was done with (10) correction for each player and from the free throw area, so that the number of successful and unsuccessful attempts for each player was calculated, the strength of each finger of the aiming arm of each player was calculated and the accurate strength data were extracted according to the innovative strength measurement device.

Main experience:

Application of corrective exercises used:

After performing the pre-tests, the researcher conducted the corrective exercises used on Sunday 3/1/2021 until Friday 12/2/2021, by conducting corrective exercises in the training units, where the researchers applied the proposed corrective exercises on the players at the rate of (4) training units every week, where the total number of units for corrective exercises was (24) units, and the duration of the exercises was (6 weeks), and the time of each corrective unit was (35%) of the main part allocated by the trainer, as the total time for the training unit was (120 minutes).

Post-test:

After completing the prepared curriculum and completing the implementation of all corrective exercises on the members of the research sample, the researcher conducted the post test on Sunday 14/2/2021 at two o'clock in the evening for all research variables with (10) corrections for each player from the free zone and the number of successful and failed attempts was calculated for every player, as the percentage of successful attempts reached (72%), while the percentage of failed attempts reached (28%), and through the number and percentage of successful attempts, the extent of development in the free throw correction process and for all players is identified, and strength is calculated for each finger of the aiming arm, for each player and the extraction of accurate force data according to the innovative force measuring device.

Statistical means:

The researcher used the statistical bag of spss, using the following statistical means:

- Mean.
- Median.
- Std. Deviation.
- Skew ness.
- (T) test for cross-linked samples.

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Table (1) shows the data of the biomechanical parameters adopted for the post test of the two research groups.

Variables		Experimental post-test		Control post-test		T value	Sig type
		Mean	Std. Deviation	Mean	Std. Deviation		
Variables of momentum to the edges Fingers of the hand	Thumb	28.40	0.50	15.04	4.81	5.440	Sig
	Index finger	44.90	1.41	18.30	1.30	17.090	Sig
	Middle finger	30.70	0.55	13.70	2.10	14.354	Sig
	Ring finger	16.50	0.71	22.60	2.55	4.187	Sig
	pinky	16.90	0.89	18.60	7.62	0.434	Non sig

Tabular (T) value (2.79), level of significance (0.01) and degree of freedom (24).

Presentation, analysis and discussion of the results of experimental dimensional control for the biomechanical variables.

Variables of thrust force at the tips of the fingers of the aiming hand and from a distance (4.225 m):

Through table (1), which shows the variables for young players, the research sample for the free throw skill of basketball, it is clear that the thumb force variable has the ball pushing. We note that the variables, each of the thumb strength, have achieved a clear improvement in the value of this variable for the experimental group compared to the control group. The value of the arithmetic mean of the thumb for the experimental group (28.40) and the standard deviation (0.50) the arithmetic mean of the control group (15.04) and the standard deviation (4.81), T tabular (2.79) and degree of freedom (24), this indicates that the difference is significant between the two groups and for the benefit of the experimental group, and the researcher attributes and through measuring the strength of the fingers of the aiming and pushing hand of the ball with the middle (palm device) to measure the strength of the fingers of the innovative hand. Its trajectory, and since the mean of the thumb is (28.40), it comes after the middle and middle in terms of power projection, the reason for the improvement of these indicators is the role of the corrective exercises used and the focus on repeating them in order to reach the best (technique) by observing the compatibility of the movement of the arm indicators aimed at investing in improving the mechanical variables as corrective and feedback exercises have a major role in improving the level of performance and exercises No.(8,4,3) I worked on developing the fingers of the aiming hand, as during scoring and the moment the ball comes out, most of the ball is centered on three thumb, forefinger and middle fingers, and the goal is to direct the ball in the correct path to the goal.

The value of the mean of the index finger of the experimental group is (44.90), the standard deviation (1.41), the arithmetic mean of the control group (18.30) and the standard deviation (1.30), and that the calculated value of (T) for the index finger variable between the two groups is (17.09) with a level of significance (0.01) and it is higher than the tabular value of (T) (2.79) and the degree of freedom (24). This indicates that the difference is significant between the two groups and in favor of the experimental group, through measuring the strength

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of the fingers of the aiming and pushing fingers of the ball with the middle of the hand (palm device) to measure the strength of the fingers of the innovative hand, the thrust force of each finger was determined, analyzed, and identified and identified the finger that has the greatest role in pushing the ball and determining its path, since the arithmetic mean of the index finger is (44.90) it is higher In the middle of my account, the fingers of the aiming hand, this indicates the importance of the index finger in determining the path of the ball, the reason for the improvement of these indicators indicates the role of the corrective exercises used and the focus on repeating them in order to reach the best (techniques) by observing the compatibility of the movement of the arm indicators aimed at investing them in improving the mechanical variables as corrective and feedback exercises have a major role in improving the level of performance and exercises No. (8,4,3) worked on developing the fingers of the aiming hand as during scoring and for a moment by measuring the strength of the fingers of the hand that the exit of the ball is most based on three fingers of the thumb, the index and middle fingers, and the aim is to direct the ball in the correct path to the goal and since the index finger is the last a finger from which the ball comes out is the final guide to the trajectory and momentum of the ball.

The value of the mean of the middle finger of the experimental group is (30.70), the standard deviation (0.55), the arithmetic mean of the control group (13.70) and the standard deviation (2.10). The tabular (T) value (2.79) and the degree of freedom (24) this indicates that the difference is significant between the two groups and in favor of the experimental group, through measuring the strength of the fingers of the aiming and pushing fingers of the ball with the middle finger (palm device) to measure the strength of the fingers of the innovative hand, the thrust force of each finger was determined, analyzed, and identified and identified the finger that has the greatest role in pushing the ball and determining its trajectory. The index finger on the one hand influencing the path of the ball, and this indicates the importance of the middle finger in applying force to the ball, the reason for the improvement of these indicators indicates the role of the corrective exercises used and the focus on repeating them in order to reach the best (techniques) by observing the compatibility of the movement of the arm indicators aimed at investing them in improving the mechanical variables as corrective and feedback exercises have a major role in improving the level of performance and exercises No. (8,4,3) worked on developing the fingers of the aiming hand, as during scoring and for a moment, by measuring the strength of the fingers of the hand, the ball exit is mostly based on three fingers, the forefinger and the middle, and the aim is to direct the ball in the correct path to the goal.

And the value of the mean of the ring finger of the experimental group (16.50) and the standard deviation (0.71) the arithmetic mean of the control group (22.60) and the standard deviation (2.55) and that the value of (T) calculated for the variable of the ring finger between the two groups is (4.18) with a level of significance (0.01), which is higher than the tabular (T) value (2.79) and the degree of freedom (24) this indicates that the difference is significant between the two groups and in favor of the experimental group, by measuring the strength of the fingers of the aiming and pushing fingers of the ball with the middle of the hand (palm device) to measure the strength of the fingers of the innovative hand, the thrust force of each finger was

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determined, analyzed, and identified and identified the finger that has the greatest role in pushing the ball and determining its path. In terms of impact, the force on the ball is small if the force is applied to the ball more than the index and middle thumb to change the path of the ball, this indicates that the force path is directed towards the index finger and the arithmetic mean to the control group (22.60), which indicates that the forces are exerted higher than the other fingers and that a correct path is not given and that the importance of the ring finger is supportive to the ball and the power projection is little, the reason for the improvement of these indicators indicates the role of the corrective exercises used and the focus on repeating them in order to reach the best (techniques) by observing the compatibility of the movement of the arm indicators aimed at investing them in improving the mechanical variables as corrective and feedback exercises have a major role in improving the level of performance and exercises No. (8,4,3) worked on developing the fingers of the aiming hand, as during scoring and for a moment, by measuring the strength of the fingers of the hand, the ball exit is mostly based on three fingers, the forefinger and the middle, and the aim is to direct the ball in the correct path to the goal.

The value of the mean of the pinky finger of the experimental group is (16.90), the standard deviation (0.89), the arithmetic mean of the control group (18.60) and the standard deviation (7.62). Tabular (T) value (2.79) and degree of freedom (24) this indicates that the difference is not significant between the two groups and in favor of the experimental group, by measuring the strength of the fingers of the aiming and pushing fingers of the ball with the middle of the hand (palm device) to measure the strength of the fingers of the innovative hand, the thrust force of each finger was determined, analyzed, and identified and identified the finger that has the greatest role in pushing the ball and determining its path, since the arithmetic mean is the pinky finger (16.90). In terms of impact, the force on the ball is less than the rest of the fingers, if it was to shed more forces than the index, middle, thumb and ring, to change the path of the ball, and the arithmetic mean of the pinky of the control group (18.60), which indicates that the forces are placed higher than the thumb and middle fingers and not giving a correct path and the importance of the pinky finger be propped to the ball and lightly projected force, the reason for the improvement of these indicators indicates the role of the corrective exercises used and the focus on repeating them in order to reach the best (techniques) by observing the compatibility of the movement of the arm indicators aimed at investing them in improving the mechanical variables as corrective and feedback exercises have a major role in improving the level of performance and exercises No. (8,4,3) worked on developing the fingers of the aiming hand, as during scoring and for a moment, by measuring the strength of the fingers of the hand, the ball exit is mostly based on three fingers, the forefinger and the middle, and the aim is to direct the ball in the correct path to the goal.

Presentation, analysis and discussion of pre-post-experimental results for biomechanical variables:

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Table (2) shows the data of the biomechanical variables approved for the pre-post-experimental test for the two research groups:

Variables		Experimental post-test		Experimental post-test		T value	Sig type
		Mean	Std. Deviation	Mean	Std. Deviation		
Variables of momentum to the edges Fingers of the hand	Thumb	24.07	0.50	28.40	0.50	7.749	Sig
	Index finger	14.59	1.41	44.90	1.41	19.167	Sig
	Middle finger	9.23	0.55	30.70	0.55	35.053	Sig
	Ring finger	25.22	0.71	16.50	0.71	11.035	Sig
	pinky	22.33	0.89	16.90	0.89	5.427	Sig

Tabular (T) value (2.79), level of significance (0.01) and degree of freedom (24).

Variables of thrust force at the tips of the fingers of the aiming hand and from a distance (4.225 m):

Through table No. (2), which shows the variables for young players, the research sample for the free throw skill of basketball is clear the thumb force variable has a ball thrust, we note that the two variables of thumb strength achieved a clear improvement in the value of this variable for the two-dimensional experimental group compared to the pre-experimental group, the value of the arithmetic mean of the thumb of the thumb of the tribal experimental group (24.07) and the standard deviation (0.50) the arithmetic mean of the post experimental group (28.40) and the standard deviation (0.05) and that the value of (T) computed for the thumb finger between the two groups is (7.749) and the level of significance is (0.01), which is higher. From the tabular value (T) (2.79) and the degree of freedom (24), this indicates that the difference is significant between the two groups and for the benefit of the experimental dimension group, and the researcher attributes and through measuring the strength of the fingers of the aiming and pushing hand of the ball with the mediator (palm device) to measure the strength of the innovative fingers of the hand, the thrust force of each finger was determined, analyzed, and identified and identified which finger has the greatest role in pushing the ball. And determine its path, and since the arithmetic mean of the thumb is (28.40), it comes after the middle finger in terms of projecting force, the reason for the improvement of these indicators is the role of the corrective exercises used and the focus on repeating them in order to reach the best (technique) by observing the compatibility of the movement of the arm indicators aimed at investing in improving the mechanical variables as corrective and feedback exercises have a major role in improving the level of performance and exercises No. 8,4,3) worked on developing the fingers of the aiming hand, as during scoring and the moment the ball comes out, most of the ball is focused on three thumb, forefinger and middle fingers, and the goal is to direct the ball in the correct path to the goal.

It is clear to us from the same table that the value of the mean of the index finger of the pre-experimental group (14.59) and the standard deviation (1.41) the arithmetic mean of the experimental dimension group (44.90) and the standard deviation (1.41) and that the calculated value of (T) for the index finger variable between the two groups is (19.167) and at the level of

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Significance (0.01) which is higher than the tabular value of (T) (2.79) and the degree of freedom (24) This indicates that the difference is significant between the two groups and in favor of the group after the experimental dimensions, by measuring the strength of the fingers of the aiming and pushing fingers of the ball by the (palm device) to measure the strength of the fingers of the innovative hand, the force of each finger is determined and analyzed, and the finger that has the greatest role is determined by pushing the ball and determining the direction of its path, since the arithmetic mean of the force of the dimensional index finger is (44.90) compared to the arithmetic mean of the tribal (14.59), it is higher this indicates a greater force, the researcher instructs that the reason for the improvement of these indicators is the role of the corrective exercises used and the focus on repeating them in order to reach the best (techniques) by observing the compatibility of the movement of the arm indicators aimed at investing in improving the mechanical variables as corrective and feedback exercises have a major role in improving the level of performance and exercises No. (8,4,3) I worked on developing the fingers of the aiming hand as during scoring and for a moment by measuring the strength of the fingers of the hand that the exit of the ball is most based on the three fingers of the thumb, the index and middle fingers, and the goal is to direct the ball in the correct path to the goal and since the index finger is the last finger from which the ball comes out is the final guide to the trajectory and momentum of the ball.

It is clear to us from the same table that the value of the mean of the middle finger of the pre-experimental group (9.23) and the standard deviation (0.55) the arithmetic mean of the experimental dimension group (30.70) and the standard deviation (0.55) and that the calculated value of (T) for the index finger variable between the two groups is (35.053) and at the level of Significance (0.01), which is higher than the tabular value of (T) (2.79) and the degree of freedom (24). This indicates that the difference is significant between the two groups and in favor of the group after the experimental dimensions, the researcher attributes, through measuring the strength of the fingers of the aiming and pushing hand of the ball with the middle finger (palm device) to measure the strength of the fingers of the innovative hand. After the index finger in terms of influencing the strength and direction of the ball's path, this indicates the importance of the middle finger in applying force to the ball, the reason for the improvement of these indicators indicates the role of the corrective exercises used and the focus on repeating them in order to reach the best (techniques) by observing the compatibility of the movement of the arm indicators aimed at investing them in improving the mechanical variables as corrective and feedback exercises have a major role in improving the level of performance and exercises No. (8,4,3) I worked on developing the fingers of the aiming hand, as during scoring and for a moment, by measuring the strength of the fingers of the hand, the ball exit is mostly based on three fingers, the forefinger and the middle, and the aim is to direct the ball in the correct path to the goal.

It is clear from the same table that the value of the mean of the ring finger of the pre-experimental group (25.22) and the standard deviation (0.71) the mean of the experimental dimension group (16.50) and the standard deviation (0.71) and that the value of (T) calculated

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for the variable of the ring finger between the two groups is (11.035) and at the level significance (0.01), which is higher than the tabular value of (T) (2.79) and the degree of freedom (24). This indicates that the difference is significant between the two groups and in favor of the group after the experimental dimensions, the researcher attributes, by measuring the strength of the fingers of the aiming and pushing hand of the ball with the median (palm device) to measure the strength of the fingers of the innovative hand. In terms of the impact of the force on the ball, it is small if the force was projected more than the index finger and the middle thumb to change the direction of the ball's path. This indicates that the force's path is towards the index finger pointing and the arithmetic mean to the tribal ring finger (25.22), which indicates that the forces are exerted higher than the other fingers and not Giving correct trajectory direction and that the importance of the ring finger is support for the ball and the application of force is minimal, the reason for the improvement of these indicators indicates the role of the corrective exercises used and the focus on repeating them in order to reach the best (techniques) by observing the compatibility of the movement of the arm indicators aimed at investing them in improving the mechanical variables as corrective and feedback exercises have a major role in improving the level of performance and exercises No. (8,4,3) worked on developing the fingers of the aiming hand, as during scoring and for a moment, by measuring the strength of the fingers of the hand, the ball exit is mostly based on three fingers, the forefinger and the middle, and the aim is to direct the ball in the correct path to the goal.

It is clear to us from the same table that the value of the mean of the pinky finger for the pre-experimental group (22.33) and the standard deviation (0.89) the arithmetic mean of the experimental dimension group (16.90) and the standard deviation (0.89) and that the value of (T) calculated for the variable of the pinky finger between the two groups is (5.427) and at the level of Significance (0.01), which is higher than the tabular value of (T) (2.79) and the degree of freedom (24). This indicates that the difference is significant between the two groups and in favor of the group after the experimental dimensions, By measuring the strength of the fingers of the aiming and pushing fingers of the ball with the middle of the hand (palm device) to measure the strength of the fingers of the innovative hand, the thrust force of each finger was determined, analyzed, and identified and identified the finger that has the greatest role in pushing the ball and determining its path, since the arithmetic mean is the dimensional pinky finger (16.90). In terms of the impact, the force on the ball is less than the rest of the fingers, if the power was shed more than the index and middle fingers, thumb and ring finger to change the direction of the ball's path, and the arithmetic mean of the pinkie is pre-experimental (22.33), which indicates that the forces are placed higher than the thumb and middle fingers and not giving a correct path to the ball. The importance of the pinky finger is a support for the ball and the application of force is very little compared to the rest of the fingers of the other hand, the reason for the improvement of these indicators indicates the role of the corrective exercises used and the focus on repeating them in order to reach the best (techniques) by observing the compatibility of the movement of the arm indicators aimed at investing them in improving the mechanical variables as corrective and feedback exercises have a major role in improving the

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level of performance and exercises No. (8,4,3) I worked on developing the fingers of the aiming hand, as during scoring and for a moment, by measuring the strength of the fingers of the hand, the ball exit is most based on three fingers, the forefinger and the middle, and the aim is to direct the ball in the correct direction to the goal.

Conclusions and recommendations:

Conclusions:

- The results of the research showed statistically significant differences in the biomechanical indicators through the values of the studied variables of the force exerted on the ball from each finger of the aiming arm after measuring it with the manufactured palm device and the angles of the above joint points in the advanced analysis program Tracker and applying corrective exercises to them.
- The results showed that the player's understanding of the mechanics of the movement contributes to the correction of the accompanying errors.
- Through the continuous repetitions of the exercises, there was an improvement in the variables related to the biomechanical indicators, which are the main source of the player's continuation of the correct motor path until the end of the performance.
- The results showed that there is a difference between the number of successful and unsuccessful throws between the pre and post tests and in favor of the post test.
- The innovative device manufactured and prepared by the researcher and the supervisor showed by measuring the strength of each finger of the aiming hand by aiming the ball to find out the strength concentration in any finger at the moment of scoring.
- Through the research results, the moment of scoring the strength of the fingers of the aiming hand, it was found that the concentration of force in the fingers (thumb, index finger, middle) and that the highest strength is in the index finger, and this indicates that the index finger is the last part of the hand from which the ball comes out.

Recommendations:

- The need for those in charge and trainers of education and training processes to pay attention to methods, principles and mechanical foundations in order for them to benefit from them in uncovering the most likely ways to reach the ideal performance.
- The necessity of equipping basketball halls and playgrounds with modern and innovative devices that will discover mistakes, strengths and weaknesses of the players, and facilitate the task of coaches in educating and training players by using the results of researchers through the values of the researched variables and corrective exercises.
- Giving sufficient time to apply corrective exercises that will correct technical errors in the performance of skills and sports movements and give them the correct path.
- Conducting similar studies aimed at detecting technical errors and correcting them for different ages and for all skills for basketball.

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