

The effect of special exercises according to the work done using the force measuring platform (Foot Scan) to develop the power transmission indicator and the accuracy of the aiming from the corner area with the hand roller

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Abstract:

Sports activities took another form to achieve progress and achievement, and thus work began to introduce applied sciences such as physiology, anatomy, biomechanics, kinesiology and other sciences in training operations, and correction from the corner area is one of the most difficult types of shooting with a hand ball as it requires high skill due to the narrow angle of correction and the proximity of the scoring area to The line of the field, as well as the presence of the opponent player and the goalkeeper of the opposing team, which makes accuracy the decisive factor in the success of the correction. Offensive does not depend on developing physical capabilities and skills, designing and building tests only, as well as the phenomenon of kinematic errors that accompany the performance and the indicator of energy transfer between the joints of the body. Therefore, scientific solutions should be developed through effective training methods to develop the physical and skill abilities of the players according to correct biomechanical conditions during Applying the vocabulary of the training curriculum and knowing the extent of its impact on developing a transfer index Energy as well as the accuracy of the skillful performance to shoot by jumping high to open the largest possible distance. And biomechanics helps us in the search for sports movements in terms of mechanical, anatomical, physiological and physics, drawing information from them as the link of the physical and anatomical aspects with the mechanical aspect, we can identify the best performance and the extent of the relationship of this performance in minutes Correct movement and its geometrical and temporal paths by discovering errors in the course of the movement and knowing its causes and working to avoid them and knowing the strengths and weaknesses in order to achieve the scientific foundations of the movement in an elaborate manner. The researchers agree with (Aref and Mohsen: 1989: 156-158), that correction from the corner is difficult because

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the defending player stands in front of the attacker on the goal area line, which requires the attacker to jump forward towards the line (4) m parallel to the goal line while keeping the ball. Out of reach of the defender. In this type of correction, we assume that the right player is aiming from the corner to the right. The goalkeeper is aimed at the left player from the corner to the left of the goalkeeper.

Keywords: *power transmission indicator, hand roller, force measuring platform*

I. Introduction:

This is for the purpose of opening the angle of aim despite the proximity of the aiming arm to the defender. Therefore, physical exercise is one of the most important methods used in developing and building the body and maintaining the health of the body if it is performed at regular times and correctly during the training process (Muhammad Ali: 1998: 17). Scientists and specialists have directed their views on physical exercise about its objectives, methods of performance and division. Accordingly, physical exercises "are a group of physical movements performed by the various members of the body according to scientific principles and foundations based on physiological - anatomical - and natural foundations, and the repetition of these exercises for one or a number of times and according to the individual's ability (Shagati: 2014: 281). Accuracy in its scientific sense means directing the movements that an individual makes towards a specific goal, and this requires high efficiency from the muscular and nervous systems, as well as the integrity of the senses, especially hearing, and this is what was confirmed (Sobhi: 1995: 459). Correction from the corner area enables the player from the most important areas affecting the accuracy of correction, in addition to that, the correction can be studied for one effectiveness from several situations, such as dividing the correction areas into several areas: primary, middle ... etc. (64-66: 2013 : JoséAntonio). This requires a high ability to exploit physical characteristics and accuracy, as well as high skill in the art of performance. The handball player must have good physical characteristics in order to be able to meet the biomechanical requirements for skillful performance such as angles of approach and angles. Pushing moments of performing correction movements, which allow the player to be highly skilled in order to be able to invest his inner strength perfectly and score the goal, and this is confirmed (Al-Fadhli: 2007: 16). Vertical Earth's gravity, which means good performance in rising moment, high thrust and good momentum. The importance of research is evident in how to develop the aiming accuracy index and the power transmission indicator from the corner area for handball players in accordance with the scientific foundations, by preparing special exercises according to the work variable achieved (strength x distance traveled) and extracting power through the force measurement platform (Foot Scan) Believing that these prepared exercises will contribute to treating weakness and trying to improve performance and their development (indicator Energy and accuracy of correction), especially from the Al-Zawiya region, which is considered one of the most difficult centers in shooting for handball players.

II. Research methodology and field procedures:

Research Methodology:

The researchers used the experimental method for its relevance to the nature of the research and its requirements, as the experimental method is the most used method in the mathematical field because it is based on direct and realistic interaction with different phenomena (Anan: 2004: 84-85).

Research community and sample:

The researchers choose a sample in which they see that it represents the original society that is studying it sincerely (Allawi and Al-Din: 2006: 244). Therefore, the researchers chose the research sample in the intentional method represented by the advanced handball players Men of Nadia (Al-Karkh and Diyala) for the sports season (2019-2020). The total number of (35) players, and the experimental sample consisted of (8) players representing the corner for both regions, four players for each club, (4) players from the right side and (4) players from the left side. As for the percentage of the sample from the research sample, it was (22.85%).

Means of collecting information, devices and tools used:

Methods for gathering information:

Arab and foreign sources, personal interviews.

Devices and tools: (kinovea) analysis program to analyze movements, and determine the work variable performed), type (Hb) computer, three tripod cameras, a scale of length (1 m), a Japanese-made (Casio-Exilim) digital camera, with high-speed imaging Up to (1200) p / s, set to work at 210 p / s. Three digital cameras at a speed of (25 p / s). Japanese-made electronic stopwatch for recording time, adhesive tape, iron squares for accuracy (50 x 40), count (4), eight balls of legal hands, six signs (30) cm, target Legal handball, phosphorescent signs, count (30), data emptying form, (10).

Field research procedures:

The researchers relied on the correction accuracy test from the Zawiya area that was built before (Faisal: 2013: 65-66)

Shooting from the corner area with the hand ball.

Test name: Shooting from the corner with a handball.

The purpose of the test: - To measure the accuracy of the aiming from the corner area with the hand pulley for the two areas.

Tools: (8) legal handballs, whistle, precision squares (40 x 50) cm, count (4), adhesive tape, (3) sign, legal handball court, handball goal.

Test planning: divides the corner area on both sides of the stadium into two areas on each side to start the correction process by placing signs with adhesive tape that mark each area. The first area of the goal line is (5.2)

meters away and the second area (5.3) meters, then signs are placed above the end of each area. To initiate the correction process as in Figure (1).

Performance description: The player stands in the designated area for each area (first and second) to start the correction process and is holding the ball and upon hearing the whistle the player performs the full movement of the shooting skill on the precision squares on the goal in sequence starting from square (A) then (B) then (C) then (D). With (8) attempts for each square (2) attempts.

- Test Instructions: It is not permissible to touch the line (6) meters, which is a false attempt when aiming from the three areas.

- If he takes more than (3) steps, it is considered a wrong attempt.

-For each region (8) attempts.

Scoring: The score (2) is calculated if the ball enters the precision square.

- A score of (1) is calculated if the ball touches the perimeter of the precision square.

-A score of (zero) is calculated if you do not enter or touch the precision square.

Determination of biomechanical variables:

The researchers, after reviewing the studies, research and theoretical materials with specialization and agreement, determined some of the most important biomechanical variable for angle correction skill, which is the measurement of work performed, kinetic energy and potential energy.

Foot Scan force measuring platform: It is a rectangular electronic platform that gives digital data and data in the form of curves to measure the dynamics of the force, as well as pressure areas in the foot when they come into contact with this platform, and it contains digital sensors with high frequencies.

Work performed: represented by the product of force by the distance traveled to reach the player's center of gravity, and the unit of measure of which is the Joule (preferred: 2010: 84-89). Work performed = force x distance traveled

Accuracy Index: This indicator was calculated by dividing the correction accuracy result by the test time and according to the approved test instructions. An example of the number of corrections on precision squares during a period of time, the accuracy indicator will be as in the example: - Accuracy index = the sum of successful correction on the accuracy / time square. For example, = $8/70 = 0.114$ number / s.

Mechanical transmission power index (Al-Fadhli: 2010: 157).

The power transmission index is one of the mechanical indicators that give a true explanation of the type of kinematic transmission achieved in the moments of rise in all jumps, through the relationship of the angle of departure (the moment of flight) and the mechanical energy (the set of kinetic and potential energy) achieved at the moment of uplift in the moments of standing and thrust, it is known. Each of the anchor moments has two important

phases, namely the thrust phase and the thrust phase, and for each of the stages we can calculate the two types of mechanical energy (latent and kinetic) which ultimately constitute the total mechanical energy. Advance to:

The total energy is the moment of standing and it is made up of kinetic energy and potential energy.

The total energy of the moment of thrust is made up of kinetic energy and potential energy.

We can call the total energy at the moment of dependence on the first total energy and at the moment of thrust

Second total energy:

The first total energy (standing) = the total energy at the moment of standing / body mass

The total energy the moment of standing is the sum of the kinetic and potential energy at the moment of the first touch of the foot of the man driving the Earth (initial energy).

Second total energy (thrust) = total energy at moment of thrust / body mass

It is the final total energy before the foot leaves the ground (before the moment of flight)

The purpose of dividing the total energy by the body mass is to know the amount of this energy in joules per (1) kg of body mass. The kinetic energy at both the moment of bearing and the thrust is calculated according to the following law: kinetic energy = $1/2 kx^2$, either the potential energy is calculated through the following law:

The potential energy = $k \times c \times p$ (p is the height of the center of gravity of the body and the measurement of the height of this center from the ground is calculated at every moment), so we can extract the energy decrease, which is = the first total energy - the second total energy and extract the energy transfer index through the following law :

Transmission power index = angle of release / energy decrease (d / joules / kg).

Pilot experiments:

The first exploratory experiment: The researchers conducted this experiment to analyze the kinematic (for the mechanical variable achieved work, kinetic energy and latent moment of reliance and impulse) on a sample of the research community consisting of (3) players on Friday at 4:00 pm corresponding to (1/11/) 2019). The first pilot was the following:

1 - Knowing the suitability of the places for placing the cameras during the video analysis from the corner areas (2.5) m and (3.5) m.

2 - Knowing the difficulties and problems when implementing the visualization, and training the working team assisting in photography.

The second exploratory experiment: The researchers conducted this experiment for the special exercises of the achieved work variable prepared by the researchers on a sample of the research community consisting of (3) players on (Friday) 11/15/2019 The second exploratory experiment targeted the following: -

1- Knowing the appropriateness of exercises with devices and aids to the sample level.

2 - Knowing the difficulties and problems when performing these exercises.

Main research procedures:

Pre-test: The researchers conducted the pre-exams on Friday and Saturday (22-23 / 11/2019) at 4:00 PM and at the Martyr Abbas Hall.

In Baquba / Diyala governorate, the researchers tested the accuracy of correction from the corner of the two areas (2.5) m and (3.5) m and analyzed the work variable achieved and the kinetic energy and latent moment of support and thrust at four o'clock in the afternoon and the hall itself as well. The researchers installed the conditions, the method of conducting the tests, and the assisting work team in order to achieve the same conditions as possible when conducting the post-tests.

Application of special exercises prepared according to the biomechanical variable (work performed):

The goal: to develop the correct performance of power transmission and accurate aiming from the corner area.

The time of the training unit: the total time of the training unit reached (120 min). As for the time taken for the independent variable of special exercises, an average time of (30-40) minutes.

Number of training units: Three training units per week, which included (36) units during the period of the main experiment.

The intensity used: from (70%) to (95%), according to the course of the training unit.

Training methods used: interval training, both types of repetitive training.

The mechanism of rationing of loads: according to the intensity of the exercise, the targeted stresses of the method used, the variable studied, and the target pulse.

The mechanism of training fluctuation: (2: 1), depending on the mechanism of adaptation.

The researchers identified a set of special exercises to develop the aiming accuracy index and the power transmission indicator from the Zawiya area to the two regions (2.5 m) and (3.5 m) (right and left) through the training curriculum prepared for that, taking into account the vocabulary of the training unit the training loads of the players as it prepared a group of Exercises at a rate of (3) training units per week for Sunday, Tuesday and Thursday for a period of (10) weeks, as the number of training units in the curriculum reached (30) training units. The special exercises were centered and prepared according to the work accomplished (power in the distance traveled) related to the power transmission index and the accuracy of shooting from the corner area for the two areas (2.5 m) and (3.5 m) and according to the intensity of the exercise in the training unit for that day and its goal. As for the exercises that were applied by the researchers within the training curriculum of the sample, its time was in the main part of the daily training unit at a rate of (30-40) minutes and with (2-3) exercises in the training unit, and for the trainer to decide which work units would be suitable for the special training unit.

Post- tests: The researchers conducted the dimensional tests on Monday and Tuesday 17-18 / 2/2020 at four o'clock in the afternoon and at the Martyr Abbas Ibrahim Hall in Baquba to determine the final results of the testers and compare them with the pre-tests in the correction accuracy test from the Zawiya area (2.5 m) and (3.5 m) and analyzing the work variable achieved and the kinetic energy and latent so that the researchers can know the difference between the pre-tests and the post-tests and the effect of the special exercises prepared for the research sample according to the work variable performed (strength in the distance traveled).

Statistical methods: The researchers used the Statistical Package for the Social Sciences (SPSS). To process data

III. Presentation, analysis and discussion of results:

Presentation and analysis of the results of the differences between mean and deviations for tests of biomechanical variables the work performed from the angle (right and left) of the area (2.5 m) and (3.5 m) in the pre-tests and post-tests of the research sample and its discussion, as shown in Table (1).

Table (1)									
Variables		A	STD	Size effect	Difference A	Difference STD	T	error percentage	Significance
Work completed for the area (2.5) m	Pre	571.970	166.597	0.807	-107.476	104.523	-3.25	0.010	Sign
	Post	679.446	169.474						
Work completed area (3.5 m)	Pre	382.790	216.183	0.956	-113.730	77.280	-4.654	0.001	Sign
	Post	496.520	251.251						

Through Table (1), which shows the differences between the pre and post tests, the arithmetic mean of the pushing variable for the area (2.5 m) for the pre-test reached the arithmetic mean (571.970) and that the pre-standard deviation reached (166.597) and the value of (the size of the effect) reached (0.807) and that the calculated value of (t) was (-3.25), that its error percentage reached (0.010), that the arithmetic mean of the differences reached (-107.476), and that a standard deviation of the difference reached (104.523). As for the differences between the pre and post tests for a variable. The pushing for the area (3.5 m) for the pre-test has reached the arithmetic mean (382,790) and that the standard deviation of the tribal has reached (216,183) and the value of (the size of the effect) reached (0.956) and that the value of (t) calculated was (-4.654). Its error has reached (0.001) and that the arithmetic mean of the differences has reached (-113.730), and that the standard deviation of the difference is (77,280). The

researchers attribute these differences to the following: What is related to the mechanical work performed for the area (2.5 m) to the significance of the mechanical work efficiency variable between the pre and post tests of individuals, the research sample to the specificity of the studied variable as the origin of the efficiency depends on the input and output ratio and in all cases and most of the studies were It depends on the amount of work produced and since the amount of force produced is in relatively close limits, the decisive factor in matters is the amount of distance or displacement achieved (work = force x distance), and the researchers find here the result of the significant change between the pre and post tests of the area (3.5 m) and it was in favor of the post- test increase is clear in the arithmetic mean, and the researchers explain that by increasing the tangible and real in one of the two job elements

The component of the efficiency variable is implicitly because the increase in one of the two variables at the expense of another or the increase in it is the outcome of the rise in the overall level and this is confirmed by (Abdul Karim and Alwan: 2012: 219-220) (So the elastic feature of muscles gives a greater output in the work of this muscle, and if I want to develop this work, the trend is in the development of the maximum strength of the muscle, which is its maximum length. The researchers confirmed that the work performed by the force of the ground response can be calculated by determining the area under the curve, and the work is calculated by the weight of the body by the force measuring platform (Foot Scan, By reading the ground reaction force curve when going down.) The researchers attribute this to the logical result in the increase in strength and related to the result of the efficiency of mechanical work, and this is what expresses the increase in the post-test from the pre-test despite the entry of time as an influential variable, but it is the functional adjustment represented by the player's level of energy relative to what he produces from the amount of thrust was in favor of Increasing the efficiency of mechanical propulsion, which is expressed in the form of the final performance of the skill that is characterized by aesthetics, interconnectedness and harmony, and this is confirmed by (Abdul Karim and Alwan: 2012: 208) (The development of the muscular force working in the skill will work to develop the momentum of strength and the momentum of the body and pushing the force which are factors Interconnected mechanism when performing most sport movements).

Presenting and analyzing the results of the differences between the mean and the deviations for the tests of the variables, the accuracy index from the angle (left and right) for the area (2.5 m) and (3.5 m) in the pre and post tests of the research sample, and discussing them as shown in Table (2).

Table (2).									
Variables		A	STD	Size effect	Difference A	Difference STD	T	error percentage	Significance
Pointing accuracy index for the area (2.5) m	Pre	4.756	0.908	0.251	-3.091	1.608	-6.079	0.000	Sign
	Post	7.848	1.575						

Pointing accuracy indicator for the area (3.5) m	Pre	3.573	1.585	0.265	3.002	3.074	3.087	0.013	Sign
	Post	6.575	3.088						

Through Table (2) for the pre-test of the accuracy indicator for the area (2.5 m), which shows that the arithmetic mean was (4.756) and that the standard deviation was (0.908). The standard deviation reached (1.575) and the arithmetic mean of the difference reached (-3.091), that the standard deviation of the difference was (1.608), that the value of (the size of the effect) reached (0.251), and that the calculated value of (t) was (6.079). Its error reached (0.000), and the level of significance between the two tests was significant. Also through Table (2) for the pre-test of the accuracy index for the area (3.5 m), which shows that the arithmetic mean has reached (6.575) and that the standard deviation has reached (3.088). As for the post test through Table (2), which shows that the arithmetic mean has reached (3.573) and that the standard deviation was (1.585), that the arithmetic mean of the difference was (3.002), that the standard deviation of the difference was (3.074), that the value of (the effect size) reached (0.251), and that the calculated value of (t) was (3.087). And that her error rate has reached (0.013). The level of significance between the two tests was significant. Researchers attribute the causes. The Significance level of differences between the pre and post test of the correction accuracy indicator variable for the area (2.5) meters and in favor of the post test in the arithmetic mean and the standard deviation. And the direct commitment by them to implement the duties required of their trainer in implementing these vocabulary effectively and regularly and using devices and tools in particular as they have been trained on gradually from easy to difficult, as the use of devices and tools is a catalyst in the growth of skills, and researchers agree with (Nassif and Hussein: 1978: 69-70) through the established exercises, "Abstract training using the tool only does not lead to reaching the best result, so we note that there is a group of auxiliary tools that the players use and according to the coach's directions to cover the deficiency, whether in terms of skill or physical, and the researchers also attribute the reasons The differences.

In the accuracy index of the area (3.5) m, this is what the researchers interpreted that the relationship between the correction result and the thrust variable and the final outcome indicates that the process of implementing the skill in a fast and elaborate manner requires the player to perform the movement in its correct technical form, which must conform to some extent with the biomechanical conditions that in turn It will reinforce the interpretation that the correct motor performance is based on controlled motion particles, and this is what was confirmed (Majeed: 2014: 150) "that focusing on the time factor and the optimal force needed to perform the movement and the results of these two elements will result in an optimal force push according to the skill requirements or the desired goal of the movement. Likewise, the time factor had a decisive role in determining the impact of the power in control during a specific period of time on the speed and accuracy of the performance of the remote aim. In the final period of time when a definite integration of the initial impulses of force is confined, the limits of integration are confined between the beginning and end moments of the period of the force's effect. At a moment when the influence of several forces coincides, the sum of their defenses equals their outcome during the same time, as there is an impulse to any exerted force even for small fractions of a second, such as cases of rise or jump. The researchers concluded that this development of the accuracy index variable is the way to use exercises

correctly, in a scientific and accurate manner, and according to the correct biomechanical conditions, through the correct position of the body and its use in a way that allows the continuation of the transfer of energy, which is transmitted from the lower extremities to the upper extremities, leading to achievement Angle shooting skill.

Presentation and analysis of the results of the differences between the mean and the deviations for the tests of the variables of the kinetic energy index (moment of standing and thrust) from the angle (right and left) in the pre and post tests of the individuals of the research sample and discussing them as shown in Table (3).

Table (3).									
Variables		A	STD	Size effect	Difference A	Difference STD	T	error percentage	Significance
Kinetic energy, reference moment, area (2.5) m	Pre	9.213	5.77	0.246	4.55	3.55	3.75	0.000	Sign
	Post	3.269	5.83						
Kinetic energy moment of thrust area (2.5) m	Pre	279.4	3.105	0.256	215.94	77.06	10.49	0.012	Sign
	Post	3.495	9.102						

Presenting and analyzing the results of the differences between the mean and the deviations for the tests of the variables, the potential energy indicator (the moment of standing and the push) from the angle (right and left) in the pre and post tests of the individuals of the research sample and discussing it as shown in Table (4).

Table (4).									
Variables		A	STD	Size effect	Difference A	Difference STD	T	error percentage	Significance
Kinetic energy, reference moment, area (2.5) m	Pre	4.279	3.105	0.211	215.94	77.06	10.49	0.002	Sign
	Post	3.495	9.102						
Kinetic energy moment of thrust area (2.5) m	Pre	1.737	17.77	0.240	101.07	76.59	4.96	0.012	Sign
	Post	2.838	119.3						

Through the results proven in Table (3) and (4), there is a Significance sign. This indicates that a significant development has occurred in the kinetic energy of the aiming skill in the post tests in an area (2.5 meters), which confirms the effective positive effect of the exercises used in the units. Training, which led to the development of energy among the players, by increasing the number of repetitions and performing the exercises with a movement path similar to the movement path of the skill, so that it works to develop the physical and skill side at the same time. The researchers attribute this development to the method of using the exercises correctly, in a scientific and accurate manner, and according to the correct biomechanical conditions, through the correct position of the body and its use in a way that allows the continuation of the transfer of energy, which is transmitted from the lower extremities to the upper extremities, until the achievement of achievement in the performance of the correction skill. Researchers attribute this value to natureThe exercises that were used in the training units, which were aimed at developing an index of energy transfer according to the variable of time, then speed and kinetic energy, not according to the height of the center of gravity of the player's body and the potential energy at the moment of reference, as the purpose is not to convert kinetic energy into potential energy by an exaggerated amount, but on the contrary, the goal of The exercises under consideration are to increase the value of kinetic energy at the expense of the value of the potential energy to improve the kinetic transmission and the speed of the transfer of the center of gravity of the player's body in a balanced and smooth manner without interruption and loss of energy, and this is confirmed by (Mahjoub and Badri: 2002. p.90) that "kinetic transmission means the expression of transmission Weighed, gradual, and continuous through the parts of the body when performing the skill, as well as the transfer of force within the body from one part to another through the joints to generate great force.

IV. Conclusion:

In light of the research results, the researchers concluded that there is a significant correlation between the aiming accuracy test and the occupancy variable performed from the angle area. For the two areas (2.5 m) (3.5 m). And well. The variable of kinetic energy, potential energy and momentary thrust variable in the area of (2.5 m) had a clear effect on the performance of the target skill, especially since the time factor, which is one of its basic components, was the effective influence in terms of the product of the force by its time of influence. There is also a positive effect of special exercises for the Zawiya area in developing the aiming accuracy index from the Zawiya areas (2.5 m) and (3.5 m) and the kinetic and latent energy transmission index for advanced handball players. This is done through the results of the pre and post tests and in favor of the post tests in the research methodology. Through the results of the pre and post tests, it was found that there is a difference between two areas (2.5 and 3.5 m) in the following variables and the correction accuracy indicator. Based on the results of the research, the researchers recommend emphasizing the necessity of using other modern scientific methods and techniques to study the momentum of the trunk or other parts of the player's body, and paying more attention to the corner center, which is one of the important and basic centers of handball, as well as the emphasis on studying and researching all the basic biomechanical variables for trunk momentum As the amount of speed and the stability of mass as well as the time of transmission of the trunk and the amount of transition distance and angle to achieve the best level of movement

momentum of the trunk or other parts of the body, as well as emphasis on handball coaches, especially coaches of age groups, interest in developing some important biomechanical variables, related to velocity and working angles on the joints of the body In order to achieve the kinetic goal of the angle correction Linking those studies through the methods used to develop the skill of shooting from the corner area (2.5) m (3.5 m) with the physical characteristics linked to the mechanical variables for the purpose of identifying the levels of the players. (Al-Fadhli: 2010: 159) indicates that, "In various games, the player must check his speed during approaching and the amount of this speed he loses the moment he rises and the consequent impulse of an ideal force consistent with the mechanical conditions of the body during this moment and with what is achieved. Of the momentum of forces and momentum of resistance during this stage, which must be proportional to a small loss of energy (total energy) during this stage in order to achieve the best movement of the player.

References:

- 1-My Passion, A Luxurious Amer; Sports Training Science, Junior Training Systems for Higher Levels, 1st Edition: Baghdad, Dar Al-Rowad, 2014.
- 2-Muhammad Ali, Nahida Ali; Exercise Theories: Cairo, Zagazig University, 1998.
- 3-Anan, Mahmoud; Readings in Scientific Research: Cairo, Arab Thought House, 2004.
- 4-Abdul Karim Sareeh and AlwanWehbe; Mathematical Biomechanics: (University of Baghdad, Ibn Rushd College, Al-Ghadeer Press for Modern Artistic Printing, 2012) pp. 219-220.
- 5- Al-Fadhli, Sareeh Abdel-Karim; Biomechanical applications in sports training and motor performance. Baghdad: Uday al-Eikili Press, 2007.
- 6- Al-Fadhli, Sareeh Abdel-Karim; Biomechanical applications in sports training and motor performance, i1, c2. Amman: Tigris House, 2010.
- 7-Ghazi, Ghazwan Faisal; Design and construction of a test to measure the accuracy of correction from the Zawiya area and its relationship to some biomechanical variables for advanced handball players. (Master Thesis, University of Diyala, College of Physical Education, 2013).
- 8-Nassif, Abd Ali and Hussein, Hassan Qasim; Strength Training: Baghdad, Arab House of Printing, 1978.
- 9-Majeed, Muhammad Jaafar; ; Analysis of the electrical activity of some working muscles and biomechanical variables and their relationship to the speed and accuracy of shooting by jumping for the Premier Basketball League players: (Master Thesis, Diyala University College of Sports Education, 2014).
- 10-Aref, Kamal and Mohsen Saad; handball. University of Baghdad: House of Wisdom, 1989.
- 11-Hassanein, Mohamed Sobhi; Evaluation and Measurement in Physical Education and Mathematics, Part 1, 3rd Edition. Cairo: Arab Thought House, 1995.

- 12- Allawi, Muhammad Hassan and al-Din, Muhammad Nasr; Measurement in Physical Education and Psychology: Oman, Arab Thought House, 2006.
- 13- Mahjoub, Mahjoub and Badri Ahmed; Origins of motor learning: University of Baghdad, Higher Education Press, 2002
- 14- José Antonio Martínez Carbonell, José Antonio Pérez Turpin; Study on the use of types of shots in Valencian Handball on professional players, *Nuevas tendencias en Educación Física, Deporte y Recreación*, 2013, n23, pp. 64-66.