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"The relationship of motor flow and some kinematic variables with precision of the Backhand stroke of the national team Badminton"

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Abstract

The importance of the research has been shown that player's performance in a smooth flow and exerted appropriate strength for the working muscles at the required speed, this will lead to improving the performance of the skill of the rear dimensional blow. It had restricted the research issue to the apparent effect of the joints and related muscles, that associated with the working body parts that affect the motor performance of the skill, for the lack of investment and employment of this effect, which represented by the mechanical flow between the body parts and kinetic transition between its parts. In addition, Investing the strength from the start of the movement to the end of the blow, principally between the lower limbs, the trunk, and the strike arm. It leads to performance failure and then slows down movement and inefficiency. The aims of the research is to:

Identify the relationship between the flowchart indicator and some kinematic variables, with the accuracy of the backhand stroke skill, for the Iraqi national team players in badminton.

The researchers used the descriptive approach in the style of relationships associative. According to the research, the community determines the players of the Iraqi national team, as men's badminton, which are six players who represent the research sample.

The researchers use scientific methods to collect information, in addition devices and tools fundamental for research requirements. For that the researchers conducted a preliminary experiment to identify the difficulties and then legally conducted a backhand stroke test), the kinematic variables affecting performance for skill were determined. Finally, the researchers photographed the performance in order to extract the mechanical variables, and use the statistical bag (spss) for the purpose of statistical data processing.

It has been concluded that kinematics has a major effect on the result of performance and accuracy of skill.

The researchers also recommend the requirement to train players and develop mechanical means and solutions which can improve the performance and flow of movement of the skill by controlling the exciting mechanical variables and the sequence of their performance clearly and better movement.

Keywords: kinematic variables, Backhand stroke, Badminton.

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Introduction:

Badminton is a recent game, but it has taken its place among other games due to the great development in its skills and this did not come by opportunity or improvisation, but rather, it is the result of scientific progress and the use of modern educational methods for the purpose of achieving sporting achievements, including the use of kinetic analysis. As science overlaps between it, including biomechanics and what it contains, such as kinetic analysis, which searches to find the optimal performance for the player and discover his strengths and weaknesses in order to find a solution to the problems facing players during play and the analysis of skill errors to avoid them later through the kinetic analysis of skill. It leads this to an improvement in the percentage of performance and achievement in it.

The badminton is characterized by the speed in performance and extended movement in cases that require rapid movement response and for the purpose of achieving achievement and championships. The badminton is characterized by the speed in performance and continuous movement in cases that require rapid movement response and for the purpose of achieving achievement and championships. The trainers and specialists used kinetic analysis and the use of technology to calculate some kinematic variables. In addition, some indicators such as the flow index and calculating the angles and speed of different body parts during movement besides recording and calculating the movement quantities of the working muscles during performing various skills during play. According to that, by calculating the kinetic flow, which means applying all the temporal properties during the movement without stopping and without sharp refraction in the engineering tracks of the centers of the masses of the body parts and the body itself. Since the movement when it is in a smooth flow must have aesthetic and an appropriate level of performance, and through this, the researchers seek to study the relationship between aerodynamics and kinetic performance of basic skills in badminton. As the researchers recognize that there is a clear effect of the joints and muscles associated with the working body parts affecting the kinetic performance of the posterior backhand stroke skill. In another hand, streamlined skill performance provides the player lots of precision and speed in performance, according to this scoring a direct point from this skill, which is one of the most significant offensive skills in badminton.

The aim of the Study:

- Identify the relationship between the flowchart indicator and some kinematic variables, and the accuracy of the back-strike skill, for the Iraqi national team players in badminton.

2. Research methodology and field work:

Research Methodology

The two researchers used the descriptive approach using the method of correlative relationships to amend the nature of the research.

2-1 Research and sample community:

The researchers chose the sample of the research deliberately, from the players of the Iraqi national team in badminton. For men (6) players, who represent the research community and its sample for the season 2018-2019.

Table (1) shows the specifications of the research sample.

sequence	Length/cm	Weight/ kg	Age Time / year of age	Age Training / year	Length The total arm	Length of the trunk	Thigh length	Leg length
1	170	70	19	9	61 cm	53 cm	42 cm	32 cm
2	171	69	18	8	58 cm	51 cm	43 cm	33 cm
3	170	67	19	9	57 cm	52 cm	41 cm	32 cm
4	176	61	17	7	56 cm	49 cm	39 cm	30 cm
5	169	64	18	8	58 cm	50 cm	41 cm	31 cm
6	176	66	18	8	59	50	40	32

2-1-1 The means of gathering information, devices, tools and the means used:

Arab and foreign sources, observation and experiment, measurements and tests, two camera Sony type with a frequency of (25) images / second, a portable computer HP, a medical scale made in Japanese, adhesive tape, a tape measure, 10 boxes of Feather (YONEX), two Regular feather badminton court equipped with tools and 10 badminton rackets.

2-1-1 The studied kinematic variables:

have been chosen the mechanical variables affecting the motor performance of the skill as follows (Figure 2):

1. First stage: the preparatory section:
- Back step foot bearing length.
- Trunk tilt angle.
- shoulder angle.
- Angle of the elbow.
- knee angle for the front foot leg.
2. The second stage: the main section and the multiplication stage:
- High starting point.
- Carpal angle at the moment of hitting.
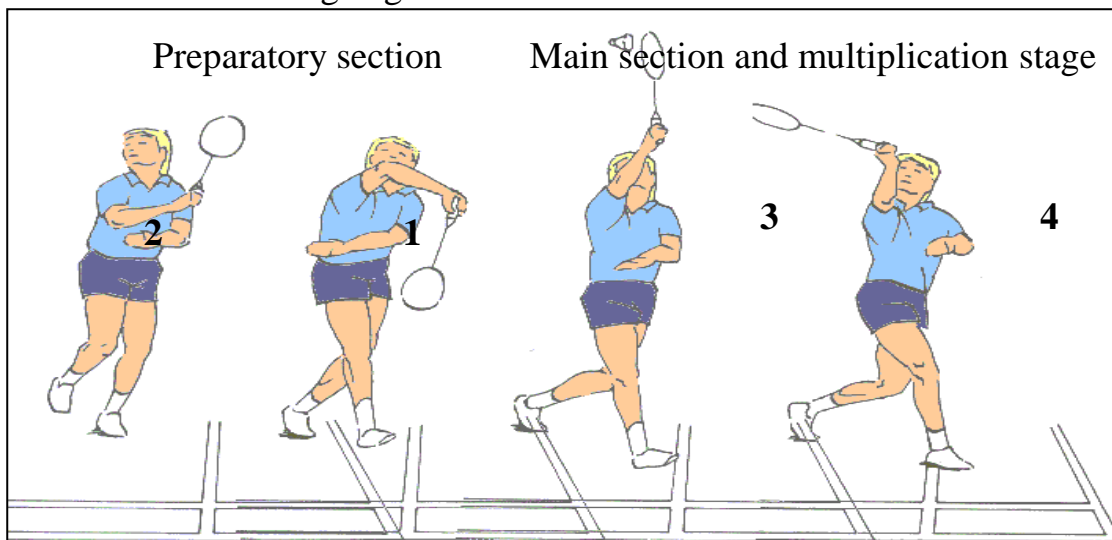- Badminton starting angle.

Figure (1) shows the technical performance and the stages of the backhand stroke in the badminton

2-1-2 Backhand stroke test [1: 85]

Test name: Backhand stroke

- **Test purpose**: To measure the accuracy of the performance of the backhand stroke.
- **Required tools**: Badminton court, badminton rackets, duct tape, tape measure, information form.
- **Performance description**: After the test is explained to the testers, the testers are given a suitable time to warm up, then each laboratory is given (5) experimental attempt.

The laboratory stands in the area designated as (x).

The trainer sends to the left of the lab (if he is holding a racket on the right arm and vice versa) so that he can hit it with a back kick.

- The laboratory is given (12) attempts, and he is considered the best(10) .
- The laboratory can move to make the attempt a success and can also leave any quill that it believes that its response does not produce a successful attempt from it.
- The maximum number of points for testing in the best (10) attempts is (40) points.

Performance evaluation:

- The laboratory is given (1) points in the event that the feather falls in the specified area with a distance of (198 cm) extending from the centerline of the square below the net to the near transmission line.
- two and three points in the event that the feather falls in the specified area with a distance of (198 cm) that starts from the near transmission line and ends with the long even transmission line.
- (4)points in the event that the badminton falls in the specified area with a distance of (76 cm) that extends after the end line of the square.
- two points in the event that the badminton falls in the specified area with a distance of (8 cm), which separates the distant double transmission line with the distant single transmission line.
- Badminton that is attached to the net or goes outside the boundaries of the stadium (except for the specified area) is not given points
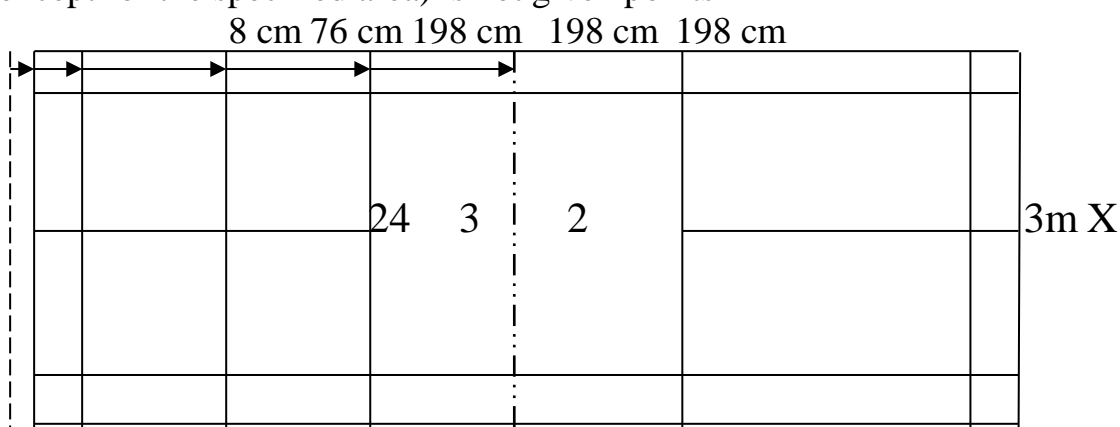

Figure (2) A layout of the badminton court for a backhand stroke test

2-1-3Main experience:

The researchers conducted the main experiment for calculating the flow of movement of the skill as a whole, as well as testing the accuracy of the skill of the backhand stroke and visualizing the performance in order to extract the studied mechanical variables for the players. The research sample was on the second of July 2019 at 9:00 am in the closed sports hall of the Faculty of Physical Education and Sports Science at the University Babylon and with the help of the assistant team, the data was gathered and extracted and then statistically processed, analyzed and discussed.

2-2Statistical means

The researchers used the SPSS statistic to extract search results.

1- View, analyze and discuss the results

Presentation, analysis and discussion of the results of the correlation of the kinetic flow with kinematic variables and the accuracy of the hitting dimensions of the badminton players.

Table (2) Shows the arithmetic mean, standard deviations, a correlation coefficient of the flowchart, biochemical variables, and accuracy of performance for a skill (backhand stroke)

Variables		Measuring units	S	P	Correlation coefficient	Significance level	Moral
Fluidity		Kgm / s	1.206	0.309	0.892	0.0001	moral
Preparation stage	The length of the first step of the pivot feet	Cm	93.62	3.55	0.0457	0.043	Moral
	Shoulder angle	Degree	125	1.678	0.044	0.045	moral
	Elbow angle	Degree	116	1.003	0.5	0.044	moral
	Front knee angle for knee brackets	Degree	156	2.087	0.023	0.104	Not moral
Multiplication stage	The length of the second step of the driving man	Cm	35.83	1.006	0.0436	0.023	Moral
	Trunk tilt angle	Degree	30.45	2.073	0.0457	0.243	Not moral
	Starting point height	cm	279.23	3.023	0.917	0.001	Moral
	Badminton starting angle	degree	44.42	2.002	0.870	0.002	Moral
Accuracy		Degree	43 .32	6.87	0.832	0.001	moral

As shown above, the correlation coefficients recorded various values of the biochemical and flow variables with the variable accuracy of performance for the backhand stroke of the players 'badminton. As it was found that all the variables recorded a significant correlation except for the knee angle variable in the setting position and the variable angle of the tilt of the trunk at the time of hitting. The researchers attribute this to the flow of movement in its preparatory and main section having a clear effect on the result of the movement and for obtaining accuracy. According to this result is consistent with what he indicated to him (Bavmgartner 1977) "The player's balance and the correct motor compatibility for body parts and muscular workflow Whatever ideal, an essential role in mechanical success is the accuracy and speed of skill performance. [2: 48]

Furthermore, the form of integrated performance is through linking the moving parts to the moving parties or participating in the movement in a harmonious way. "Every movement of the body's movement aims to achieve the high final velocity. The most appropriate length of the acceleration path has to be exploited by setting the conditions for each game and taking into account the level of muscle strength and the ability to match the moments of absorption and propulsion.

The researchers attribute that the high result of accuracy that the players got in testing, that this is because the most important parts of the skill are the lower limbs, the trunk, and the arm, which came linked to a good flow and therefore the outcome of the movement was feasible, and that the accuracy achieved a link with the flow. The movement reflects the kinetic compatibility, and that the flow of movement is related to the compatibility of the force instructions between them with the external force, principally the forces of continuity, and that the change of direction in the form of angles or the sudden increase of the force or its decrease is due to the lack of compatibility in the muscle instructions. [3: 435]

Therefore, the authors find that the variables of the length of the first step of the forward anchor foot, the shoulder angle and the elbow angle of the struck arm in the preparation position has achieved a good correlation, As the player, in the preparation mode, tries to make the essential bends in the elbow and shoulder joint to lengthen the acceleration distance, achieve the weighted, and gain the necessary strength in the next stage. As the player is trying to catch the next feather against the hitting arm, which is at the highest point in the air by lengthening the first step to the front foot. So any excessive flexion in the knee joint will be obstructive to movement and flow, as the badminton will be far from the player. Each excessive flexion in the knee joint will be obstructive to movement and flow, as the badminton will be far from the player.

Consequently, it will affect the height of the starting point and the starting angle in the hitting stage. Therefore, the correlation with regard to the knee angle was not significant, and this does not mean that the angle of the knee is not a role in the flow of movement, but the excessive bending of the knee during this stage is negative and leads to a loss of momentum and kinetic transmission between the lower ends and the trunk.

With regard to variables (the length of the second step of the driving man before hitting, the angle of the badminton and the height of the starting point), which

achieved a good correlation with accuracy. This lead to a logical result as the first step is a preparation for the step of payment in the hitting stage, therefore, it is a relatively small step, and accordingly, the center of body mass is at an appropriate height from the ground, and it represents what the body possesses in terms of stability or inertia. Consequently, the higher the body's mass center, the more often it leads to an increase in flow and movement between the body's parts in particular and in the transitional body's movement in general, and transfer the speed from the horizontal direction to the vertical direction to achieve the highest starting point and thus a good starting angle. That is the reason to find that whenever the player's inclination towards badminton is large, it indicates that the previous steps and exceptions were not at the required levels, therefore the player works to compensate for his body's tendency towards the badminton to catch up with it. Consequently, it will be a stop in the parts of the movement in addition to the lower of the starting point, and therefore the angle of departure of the feather will be useless and this will be reflected in the accuracy of performance.

Objectively, as the arm with the racket forms a part with a relatively high self-failure because of the length of the lever and therefore a good flow achieves a logical velocity of the arm through the transmission of movement between parts of the body. (4: 127)

So the result was logical in the variables of the multiplication stage and became an internal control of the movement parts. As it has been shown that the correct movement between parts of the body leads to a logical and correct result. Has been found that achieving the mechanical requirements for starting the ball with high accuracy requires achieving speed and a good angle in obtaining the values of these two variables, and this means that there is positive timing to perform this skill. (5: 334)

The researchers believe that the moral relationships of the steps of jumping and pushing, the elbow angle and the wrist angle are closely related to the nature of the skill, which is characterized by the speed and accuracy of performance and the implementation of the final part of the movement. Which requires kinematic correlation between its chained parts and is an expression of good performance of the research sample. Since improving the player's mental ability, it comes through controlling the correct timing and working the muscles at the right time and in a correct sequence during performance. (6: 49)

Conclusions and recommendations:
Conclusions:

1. There is a significant correlation relationship between the kinematic flow variable and the biochemical variables with the accuracy of the backhand stroke skill, for the sample players.
2. The research results of the skill showed that the three stages of skill performance are influenced effectively by the kinetic flow variables and the kinematic variables and therefore the accuracy of the skill.
3. The results of the research showed that the success of the skill is related to the kinetic flowchart through performance correlation and high compatibility of the stages of performance of the skill (the final preparatory main) and for that achieving better accuracy.

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Appendix (1) Experts Who interviewed by the researcher

Seq.	Expert Name	Scientific title	Workplace	Role	Notes
1	Dr. Hisham Hindawi	professor	the College of Physical Education / Al-Qadisiyah	specialist in motor analysis	
2	Dr.Ali Jawad Abdul	professor	College of Physical Education / Babel	kinetic analysis specialist	
3	Dr.Mazen Hadi Kazar	professor	the Faculty of Physical Education / Babel	learning a feather	
4	Dr. Nada Nabhan Ismail	professor	the College of Physical Education / Baghdad	quill tests	
5	Dr. Maher Abdel Hamza	professor	the Faculty of Physical Education / Babel	Babel Risha training	
6	Dr. Safaa Abdel-Wahab	Assistant Professor	the Faculty of Physical Education / Babel	specialist of kinetic analysis	
7	Dr. Jabbar Ali Kadhim	teacher	the Green Qasim University,	learning a feather	

Appendix (2) Work team

Full Name	Role	Workplace
Qusai Sami	national team coach	Central Iraqi Federation of Badminton
Samer Salah Abdul Hussein	a national team player	Central Iraqi Federation of Badminton
Hussein Hamza Kazem	University team player	College Physical education and sport science / babel