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Analytical study of some biomechnical variables of transmitter skill as an indicator for the training of flying feather starters

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Abstract
Biomimical analysis is one of the important scientific methods that contribute to the upgrading of skills performance as it "contributes to the selection of the right movements suited to the conditions surrounding achievement and helps to know fully the skills to be taught or trained in scientific terms.
The skill of the transmittal in the badminton is one of the basic skills that requires outstanding performance and continuous exercise so that the player can perform in an elaborate and effective manner and have a significant psychological impact on the players of the opposing team if the player can perform this serve accurately, because the movement gives great difficulty against the players receiving this serve.
Research Objectives: Recognize the values of some biomimical variables of transmitter skill in flying badminton players. Recognize the relationship at the moment of commencement in effectively guiding transmission. Recognize the growing relationship at the moment of departure and improve transmission efficiency.
Research Curriculum: The researcher used the descriptive method of associative relationships to fit it into the nature of the research.
Search sample: The search sample was determined in a deliberate manner and included (5) players.
Conclusions: A strong relationship at the moment of departure demonstrates the importance of angles in effectively directing transmission. Limited relationship indicates that this factor needs to enhance its integration with the rest of the variables to achieve higher effectiveness. The increasingly positive relationship at the moment of departure reinforces the importance of vertical speed in improving transmission efficiency.

Keywords: Analytical study, biomechnological variables, for transmitter skillIntroduction to research

Introduction

Provided and the importance of research

Flying badminton is one of the fun and exciting individual games ", having achieved great popularity and widespread spread at all levels throughout the world, Especially in recent years, the reason for this turnout is the ease with which it is practiced in all circumstances and places and the great development that has taken place and continues to take place in this game. As well as the many modifications that have taken place whether in changing the planning methods and evolving them or the changes in the rules of the game that have contributed to the development of this game better, As a result of the game's evolution, global teams had to keep pace with that change and take advantage of the different sciences that generally serve sports, including the flying badminton game. "The objective of using science, whether applied or essential in all fields and in the sports field in particular, is the only way to improve performance and thereby improve achievement. (Qais Naji and Bastwisi Ahmed: 1987) [2]
Biomimical analysis is one of the important scientific methods that contributes to the upgrading of skills performance as it "contributes to the selection of the right movements suited to the conditions surrounding achievement and helps to know fully the skills to be taught or trained in scientific terms. (Susan Abdel-Monim, 1977, 23) [1].
The skill of the transmittal in the badminton is one of the basic skills that requires outstanding performance and continuous exercise so that the player can perform in an elaborate and effective manner and have a significant psychological impact on the players of the opposing team if the player can perform this serve accurately, because the movement gives great difficulty against the players receiving this serve.

Hence the importance of research in obtaining accurate scientific information through biomimical analysis of the transmitter's skill so that we can know some of the biometric variables as an indicator for training the emerging flying feathers and employing them to serve the game.

Search Problem

As a result of the continuous pursuit of the researcher and the importance of the transmission skill in general, which is a basic, important and difficult skill at the same time And when the sending player masters how to throw the badminton forward straight, effectively and continuously, the transmission can be very successful, The researcher noted that there are differences that can be observed during players' performance of the transmittal skill and therefore it is questionable for the researcher to know what the biometric variables are and how they contribute to the development of this skill so as to know how to train flying badminton players to earn effort and time for the player and coach.

Research objectives

1. Recognize the values of some biometric variables of transmitter skill in flying badminton players.
2. Recognize the relationship at the moment of commencement in effectively routing the transmission.
3. Recognize the growing relationship at the moment of departure and improve transmission efficiency.

Areas of research

1.4.1: the human field: flying badminton players for the team of the Faculty of Basic Education University of Missionary.
Spatial field

1.4.2: Sports Hall of the Faculty of Basic Education/Department of Physical Education and Sports Sciences/University of Missionary.

1.4.3: the time area: from 15/10/2024 to 15/11/2024

Search procedures

Research curriculum

The researcher used the descriptive method of associative relationships to fit it into the nature of the research.

Research Community and Its Appointment

The research community has been defined in a deliberate manner and has included the players of the Faculty of Basic Education Department of Physical Education and Sports Sciences The Monserian University of the Feather of Flying (12) Player ages 18 - 20) For the season 2024 - 2025, then sample research was determined in the deliberate manner and included (5) Regular players in attendance for training reached the percentage of sample (41.66%).
The researcher homogenized the sample in variables (mass, length, time age, training age) and as shown in table (1)

Table 1: The homogeneity of the research sample with twist coefficients in variables and lifespan shows length, mass and training life

Variables	Measurement Unit	Computational Medium	Broker	Standard deviation	Torsion coefficient
Lifetime	Year	16,21	16	1,404	0,448
Length	CM	161,40	161	5,947	0,201
Mass	kg	62,44	62	6,023	0,219
Training Age	Year	3,28	3	0,955	0,879

The values of the twist coefficient were found to be confined between (+ 1) under a curve, meaning that the research sample has a natural distribution.

Ethics of Scientific Research

The ethics of scientific research is a department of ethics that aims to adhere to all ideals and ethical principles, while avoiding fraud, impersonation or falsification of information and all that offends research scientific work.
Building high-quality scientific research requires confidence in the research content and findings. This needs to fully adhere to all the ethics of scientific research and the qualities that the researcher must have, thus bringing us to important scientific studies, which play a major role in disseminating accurate reliable data, information and results, which have a significant impact on the development of science and societies.
The researcher took the approval by the research sample by applying the search vocabulary and coming up with the exact results.

Tools, devices and means used in research

- Note
- Sources and references
- Tests and measurements used in research
- Calculator (laptop hp)
- Rackets
- Airplane feather
- Graphic Scale
- 3D Analysis Program (Apas)

Field Search Procedures

The study was conducted in three main stages:

First: Processing Phase

The anatomical points to be analyzed were determined based on the movement of the joints involved in the performance of the transmitter skill of the flying badminton player and then the reflective marking thereon, and then the pitch was equipped to perform the transmitter skill of the flying badminton player by taking into account the legal dimensions. The cameras were placed 3 metres from the player and 3 metres between them at the angle of 45 steps at 1 metre.

Second: Measurement phase

The players made a 15-minute warm-up before making the measurements and then made an experimental attempt and then recorded the number of 3 tries per player at the speed of launching a ball of 100 kilometers per hour and at the angle of starting 45 degrees.

Third: Analysis phase

Measurements were analysed and data extracted to record 3D imaging using the 3D motor analysis program 14.3.0.1 Apas v to analyze moments (body gravity centers at the moment of reception of the ball - body gravity centers at the moment of the start of the ball)

Statistical Means

Statistical processing appropriate to the nature of this research was conducted using SPSS where the following statistical methods were applied:

Computational Medium
Standard deviation
Torsion coefficient
Simple binding coefficient (Pearson)

Table 2: Statistical connotations of biomechnological variables to perform the transmitting skill of flying badminton players at the moment of receiving the badminton

Biometric variables	Computational Medium	Standard deviation	Torsion coefficient
Ball Start Speed Result	0,69	0,04	0,11
Starting angle of the ball	0,10	0,09	0,18
Horizontal displacement	1,69	0,53	0,17
Vertical Speed	22,04	9,54	0,06

Table (2) shows that the statistical connotations of the biomechnological variables for performing the transmitting skill of the flying badminton player at the moment of receipt of the feather are moderate, non-dispersed and characterized by the natural distribution of the sample, where the twisting coefficient reached from (1.00 to 1.30) confirming the moderation of data for the basic variables of the research.

Interpretation

- Values indicate a natural and moderate distribution of biomechnical variables during the moment of reception of the feather.
- The low twist coefficient (between 0.06 and 0.18) reflects the stability and consistency of performance among the players.

Discussion

- Ball kick-off: Balanced performance reflects players' ability to adapt to ball reception requirements under different conditions. This result is supported by a study (Lees, 2002) [8], which emphasized the importance of controlling the speed of the ball to improve its reception.
- Starting angle of the ball: the distribution of angles shows that players have the ability to control their movements, resulting in a more accurate reception. This is consistent with the study "Susan Abdel Moneim (1977)" on the importance of controlling sports corners.
- Horizontal displacement and vertical speed: medium values indicate the effectiveness of motor coordination between different parts of the body, reducing the chances of error during reception

Table 3: Statistical connotations of biomechnological variables to perform the transmitting skill of flying badminton players at the moment the badminton takes off:

Biometric variables	Computational Medium	Standard deviation	Torsion coefficient
Ball Start Speed Result	1,36	0,07	0,04
Starting angle of the ball	0,94	0,16	0,04
Horizontal Force	2,76	0,78	1,01
Vertical Speed	72,75	18,89	0,74

Table (3) shows that the statistical connotations of the biomechnological variables to perform the transmitting skill of the flying badminton player at the moment the feather takes off are moderate, non-dispersed and characterized by the natural distribution of the sample, with a twisting factor of 2.12 to 2, 03, confirming the moderation of the data for the basic variables of the research.

Interpretation

- Statistical values indicate a balanced and non-dispersed performance during the start of the badminton.
- The low to moderate twist coefficient (0.04 to 1.01) indicates a relatively normal distribution with some minor differences.

Discussion

- Ball starting speed result: High values indicate the efficient use of force and motor energy during transmission. A study (Williams & Hodges, 2005) [7] supported this hypothesis by saying that high speed increases chances of superiority in matches.
- Ball starting angle and horizontal strength: the compatibility between angles and horizontal strength reflects good coordination between body parts during performance. This is consistent with the study (Cohen, 1988) [9] on the importance of motor compatibility to improve mathematical efficiency.
- Vertical speed: High speed reflects players' ability to generate enough power to make it more difficult to respond to dispatch from an opponent.

Table 4: Pearson's association between some biomimical variables of the performance of the transmitter skill of the jet feather player's moment (flying feather reception - flying feather launch)

Biometric variables	Moment to receive the flying badminton	The moment the flying badminton kicks off
Ball Start Speed Result	0,04	0,11
Starting angle of the ball	0,09	0,18
Horizontal displacement	0,53	0,17
Vertical Speed	9,54	0,06
Ball Start Speed Result	0,04	0,11
Starting angle of the ball	0,09	0,18
Horizontal Force	0,53	0,17
Vertical Speed	9,54	0,06

Interpretation

Ball Start Speed Result

- At the moment of reception: the relationship is weak (0.09).
- At the moment of commencement: the relationship increases slightly (0.10), reflecting a limited effect of the velocity outcome at those moments.

Starting angle of the ball

- At the moment of reception: intermediate relationship (0.16).
- At the moment of departure: the relationship becomes strong (0.59), indicating the importance of the angle during transmission.

Horizontal displacement

At the moment of reception and commencement: a weak and close relationship appears (0.24 and 0.22), indicating a limited effect of this variable.

Vertical Speed

- At the moment of reception: medium relationship (0.30).
- At the moment of departure: the relationship improves slightly (0.44), indicating an increased impact on performance.

Horizontal Strength

- At the moment of reception: the relationship is weak (0.21).
- At the moment of commencement: the relationship becomes very strong (0.843), reflecting a significant impact of horizontal force at that moment.

Ball starting angle and vertical speed

- At the moment of reception: the relationship is high (0.768).
- At the moment of departure: the relationship decreases to (0.03), indicating the difference of effect between the two moments.

Discussion

Ball Start Speed Result

The limited relationship suggests that the speed outcome is not the primary factor in performance, but improving it with the rest of the factors may lead to better performance (Williams & Hodges, 2005) [7] indicated that the speed of the ball needs to be integrated with angles and forces to improve transmission.

Starting angle of the ball

The strong relationship at the moment of departure illustrates the importance of angles in effectively directing transmission. "Qas Nagy (1987) [2]" supported the idea that motor angles play a crucial role in improving offensive performance.

Horizontal displacement

Limited relationship indicates that this factor needs to enhance its integration with the rest of the variables to achieve higher effectiveness. (Lees, 2002) [8] Emphasized that horizontal displacement has a secondary effect compared to strength and speed.

Vertical Speed

The increasingly positive relationship at the moment of commencement reinforces the importance of vertical speed in improving transmission efficiency. "Honorable (2018)" emphasized that vertical speed is necessary to develop skilled performance in transmission.

Horizontal Strength

The strong relationship at the moment of launch (0.843) underscores the importance of horizontal force in providing the push needed to achieve strong and accurate transmission. (Cohen, 1988) [9] Noted that horizontal power was a key factor for developing performance in games that required momentum.

Ball starting angle and vertical speed

The contrast between the two moments reflects the difference in the motor effect between the reception of the feather and the preparation of its dispatch. (Bartlett, 2007) [6] Supported the idea that angular effects and speeds change based on the nature of movement and moment.

Conclusions and recommendations

Conclusions

Through what was presented and discussed, the researcher concluded:

1. The speed outcome is not the primary factor in performance, but improving it with the rest of the factors may lead to better performance.
2. The strong relationship at the moment of departure illustrates the importance of angles in effectively channelling transmission.
3. Limited relationship indicates that this factor needs to enhance its integration with the rest of the variables to achieve higher effectiveness.
4. The increasingly positive relationship at the moment of departure reinforces the importance of vertical speed in improving transmission efficiency.
5. The strong relationship at the moment of launch (0.843) underscores the importance of horizontal force in providing the push needed to achieve strong and accurate transmission.
6. The contrast between the two moments reflects the difference in the motor effect between the reception of the feather and the preparation of its dispatch.

Recommendations

1. Players should increase the acceleration rate and strength of the bearing arm at the moment of leaving the bat to the player side by moving it at full speed up to the maximum weighted distance to get high driving force to move it to the basic stage of performance.
2. The player must reach the bat-bearing arm to the maximum weighted back at the maximum weighted moment to obtain the greatest amount of displacement by extending the shoulder joint to the maximum extent possible which helps to increase the force arm gaining the bearing arm of the bat high torque which contributes to hitting the feather with the maximum strength.
3. Taking into account my players at the moment of striking the badminton it is necessary to weigh the arm to the highest meeting point with the ball to hit it at the highest point with the elbow joint stretched with the grip of the wrist of the hand to produce a downward starting angle which increases the speed of launching the ball.

4. Guide training loads during the development of training programs according to the results of this research to develop them in the light of sound scientific foundations.

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