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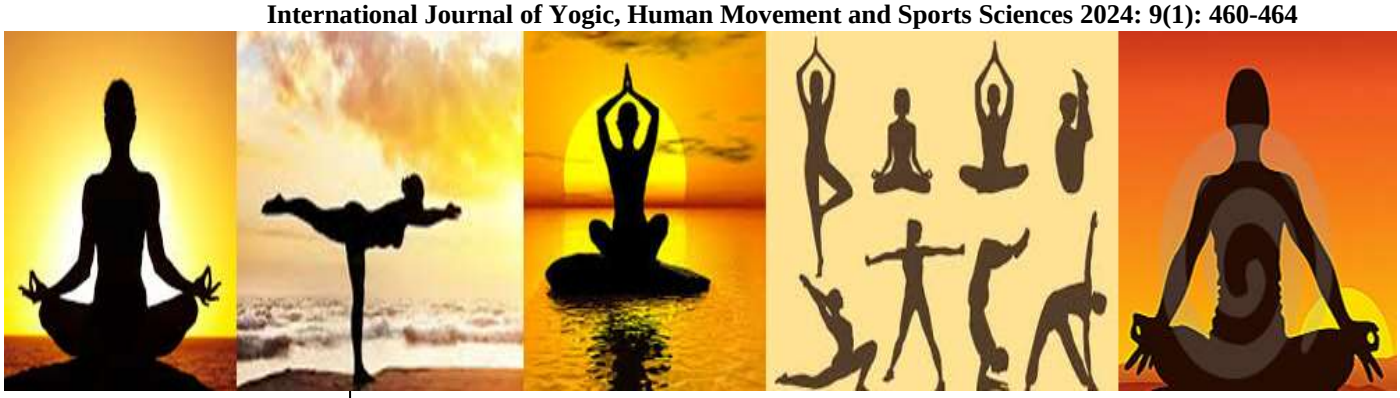

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The relationship of some elements of physical fitness and compatibility in performing the forehand smash of badminton

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Abstract
Background: Studying the physical characteristics that distinguish players at high levels of sports is one of the factors relied upon in determining the typical specifications required for a badminton player. A person's practice of any activity leads to physiological changes in the body's systems, and these changes are temporary, that is, they accompany the practice of the activity itself, including: What is always acquired by a person and becomes one of his distinctive characteristics.
Objective: Identify the values of some elements of physical fitness and compatibility for badminton players. Identifying the relationship between some elements of physical fitness, coordination, and crushing stroke among badminton players. players.
Conclusions: The study found a weakness in the physical and harmonic aspect of the research sample, which affects the accuracy of the frontal crushing strike of the badminton, and also the weakness of the physical and harmonic abilities negatively affects the accuracy of the frontal crushing strike of the badminton in the research sample.

Keywords: Elements of fitness and compatibility, forehand smash

Introduction
The sports field is witnessing a rapid development in its various tracks, as it is of great importance in the life of society, as the most important basic pillar that gives the individual the freedom to choose activities that express his latent capabilities and potentials, and scholars have agreed that practicing sports is the first pillar in how the individual deals with challenges. Life better.
The scientific progress that characterized sports in its various tracks was the result of sound scientific planning, which relied on objective scientific foundations, appropriate modern equipment, and according to scientific programs to qualify and train the leading cadres in the fields of sports.
In addition, the study of the physical characteristics of the players of the higher levels of sports is considered one of the factors that depend on it in determining the typical specifications that are required to be available in the badminton player. Himself, including what is always acquired by a person and becomes one of his distinctive characteristics.
Whereas, the elements of physical fitness are a set of functional and coordinating qualifications that distinguish players from each other, according to genetic or training data [13]. The importance of the research lies in opening new horizons for the development of some physical fitness and compatibility abilities to develop the performance of the game.

Research problem
The smash hit is one of the basic skills in the game of badminton, which is characterized by its importance in matches as an effective offensive skill, which plays a major role in achieving important results for any team and making it one of the advanced teams, so any athlete must pay attention to this aspect and give it some importance.

The research problem emerged in the variation in the physical and adaptive capabilities of the research sample, which may lead to a variation in the accuracy of their crushing strike, so the researcher decided to study the relationship between some elements of physical fitness and compatibility in badminton among the research sample.

Search target

1. Identify the values of some elements of physical fitness and compatibility for badminton players.
2. Identifying the relationship between some elements of physical fitness, coordination, and crushing stroke among badminton players.

Research areas

Human field: Assyrian Club players for the 2022-2023 season
Time range: 1-7-2023 / 12-7-2023
Spatial area: The hall of the Assyrian Club

Research Methodology

The researcher used the descriptive method using the correlational method to suit the nature of the research.

The research community and its sample

The research population was determined in a deliberate manner and included the players of the Revolutionary Badminton Club, who numbered [12]. Players aged (15-16 years) for the 2022-2023 season. Then, the research sample was determined in a deliberate manner and included [5]. Players who regularly attend training and amounted to Percentage of the sample (41.66%).

The researcher homogenized the sample in variables (mass, height, chronological age, training age), as shown in Table (1)

Table 1: It shows the homogeneity of the research sample with the torsion coefficient in the variables of chronological age, length, mass, and training age

Torsion modulus	Standard deviation	Mediator	Arithmetic mean	Measuring unit	
0,448	1,404	16	16, 21	year	chronological age
0,201	5,947	161	161, 40	poison	height
0,219	6,023	62	62, 44	kg	Bloc
0,879	0,955	3	3, 28	year	training age

It has been proven that the values of the torsion coefficient are confined between (+1) under the curve, and this means that the research sample has a normal distribution.

Tools, devices and means used in the research

- Note
- Sources and references
- Tests and measurements used in research
- calculator (hp laptop)
- Speculators
- Flying feather
- Scale drawing

Field research procedures

Tests used

1. Test name: Arm flexion and extension test (Shennaw) from the forward position (10 seconds) [5]

Purpose of the test: Measuring the force characteristic of the speed of the muscles of the arms.

Tools: Stopwatch

The method of performance and measurement: from the forward-supporting position, noticing that the body has taken the correct position, bending the arms and then fully extending them as in Figure (1), and the number of times the arms are bent and extended correctly within (10) seconds.

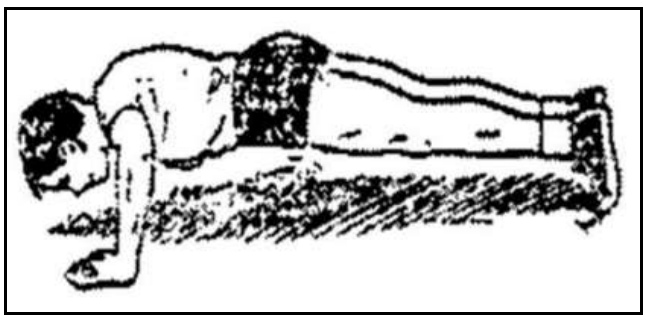

Fig 1: Shows the state of illiterate support

The test of running between the pillars for a distance of (20 m) [2]

Tools used: measuring tape, (10) indicators, stopwatch, whistle.

Performance method: The player stands on the starting line, which is 2 meters away from the first person

The player, after hearing the whistle, runs across (10) signs for a distance of (20 m), so that each person is at a distance of (2 m) from the other, where the importance of the signs lies in the performance of the zigzag movement that the player performs by passing the signs

Recording method: The timer calculates the time from the moment the player starts until the player passes the last marker.

Rounds the time to the nearest 1/100 second. So that one attempt is given to each player

Harmonic tests

1. Throwing and receiving balls [2]

Its purpose: to measure the coordination between the eyes and the arms

Tools: tennis ball, wall, draw a line five meters from the wall.

Performance method: The tester stands in front of the wall and behind the line drawn on the ground, as the test is carried out according to the following sequence:

1. Throw the ball five times in a row with the right hand, with the tester receiving the ball after it bounces off the wall with the same hand.
2. Throwing the ball five times in a row with the left hand, with the tester receiving the ball after it bounces off the wall with the same hand.
3. Throwing the ball five times in a row with the right hand, with the tester receiving the ball with the left hand. As in Figure (2)

Scoring: For each correct attempt, a grade is calculated, meaning the final grade is (15 grades).

Fig 2: Shows throwing and receiving balls

Numbered circuits test [4]

Its purpose: to measure the coordination between the eyes and the legs

Tools: Stopwatch, chalk. Draw eight circles on the ground, each of which should be 60 cm. Draw the circles as shown in the figure.

Performance method: The tester stands inside circle No. (1) when he hears the start signal, he jumps with both feet together؛ to circle No. (2), then to circle No. (3), and so on until circle No. (8), and this is done at full speed. As in Figure (3)

Recording: seconds (time).

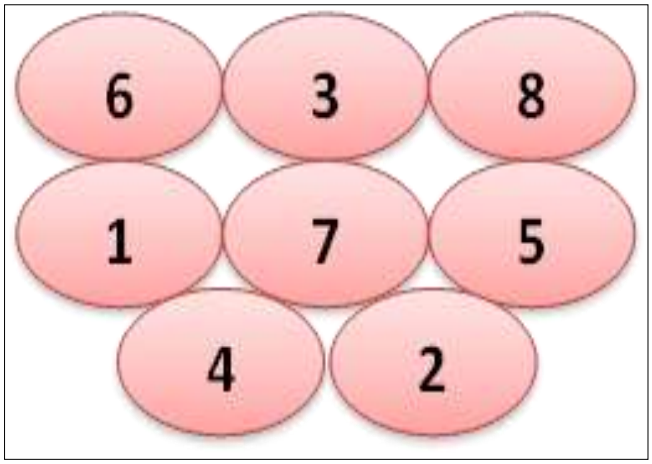

Fig 3: Shows the numbered circles

Badminton smash test [14]

The purpose of the test: to measure achievement in the crushing blow skill.

Application of the test: It was applied to a sample of students from institutes and colleges for both sexes Evaluation of the test: The degree of reliability was (0.78) and objectivity (0.83).

Required equipment: badminton rackets, badminton, rope, extra posts with a height of (213) centimeters, an assistant to serve the shuttlecocks, as well as a court lined with test lines.

How to perform the test

The player stands in the place designated for him and returns the shuttlecock sent to him from an opposite area with a strong crushing blow, trying to drop it in the area with the highest degree, provided that the shuttle passes over the net and under the rope fixed behind the net at a distance of (60) centimeters and a height of (213) centimeters. Play By performing (20) attempts, noting the power of the crushing blow by experts.

Score calculation

The score is given according to where the feather falls.

If the shuttlecock does not pass over the net and under the rope, or if it falls outside the designated areas, it is given a zero

The badminton that falls on a line between two areas is given the highest degree.

Grades are divided into regions [1, 2,3, 4, 5]

The final score is the sum of the scores of (20) attempts.

Exploratory experience

Experts in the field of scientific research often emphasize the necessity of conducting a survey experiment for the tests used in research because it is a preliminary study that the researcher performs on a small sample before conducting a research, and the researcher conducted the experiment on the date of 1\7\2023 in the hall of the Assyrian Badminton Club from the research sample.

Application tests

After completing the exploratory experiment and ensuring the validity of the tests, the main and final experiment was conducted on 4/7/2023 on the main sample.

Statistical means

Arithmetic mean

Standard deviation

Simple Correlation Coefficient (Pearson)

Presentation and discussion of results

Show results

Table 2: It shows the arithmetic means and standard deviations for the research sample in physical and compatibility tests

Torsion coefficient	Standard deviation	Median	Arithmetic mean	Physical and compatibility tests	
0,2	0,84	4,5	4,94	Arm flexion and extension test (Shennau) from the forward position (10 seconds)	1
0,5	1,76	3	5,16	Test of running between the blocks for a distance of (20 m)	2
0,1	0,46	3	1,4	Ball throwing and receiving test	3
0,2	0,53	6	2,66	Numbered circuit test	4
0,2	0,42	6	2,68	Badminton smash test	5

From Table (2) it is clear that the arithmetic mean of the physical and harmonic tests (the flexion and extension of the arms test (Shenaw) from the frontal position (10 seconds), the running test between the figures for a distance (20 m), the ball throwing and receiving test, the numbered circles test) respectively were (5.16 \ 1.4 \ 2.66 \ 24.3) and the median was respectively (4.5 \ 3 \ 2 \ 6) and the standard deviation of the tests was (the flexion and extension of the arms test (Shenaw) from the forward position (10 seconds), the running test between the signs for a distance (20 m), the test of throwing

and receiving balls, and the numbered circles test) respectively were (0.84 \ 1.76 \ 0.46 \ 0.53), and the torsion coefficient for the tests is as follows (0.2 \ 0.5\01\0.2).

Table 3: Explains the correlation between physical tests and slam dunk achievement

Achievement smash test	Physical tests
0,11	Arm flexion and extension test (Shennau) from the forward position (10 seconds)
0,31	Test of running between the blocks for a distance of (20 m)

Table (3) shows that there is a significant correlation at an error rate of (0.05), and it turns out that there is a significant correlation between each of the physical tests (the flexion and extension of the arms test (Shenaw) from the forward leaning position (10 seconds), the running test between the figures for a distance (20m) if the value of (t) calculated respectively reaches (0.32 / 0.40) with an error rate of (0.05).

Table 4: Explains the correlation between compatibility tests and completion of the smash hit

Achievement test for smash hit	Physical tests
0,11	Ball throwing and receiving test
0,19	Numbered circuit test

Table (4) shows that there is a significant correlation at an error rate of (0.05), and it turns out that there is a significant correlation between each of the physical tests (throwing and receiving balls test, numbered circles test) if the value of (t) calculated in a row reached (0.31 \ 0.22) at an error rate of (0.05).

Discuss the results

Discussing the results of correlations between some physical abilities and achieving a smash hit with badminton

The researcher attributes this to the fact that performing such a skill requires the player to have a great deal of physical training and precision in handling the shuttlecock, as the clear purpose of the forehand is to force the opposing player to retreat to the back court section, where it can be used as an offensive and defensive method [1].

The researcher also attributes that the performance of crushing hitting requires explosive ability of the arms, which is one of the basic physical requirements that achieve success in performing this skill. Applications of explosive movements to be able to achieve victory in them, and this means that the respondents were not at a good level in these abilities that qualifies them to apply the performance correctly, and the crushing hitting skill requires performance in it to Integration of the elements of strength characterized by speed in the arms and agility, as it is not possible to achieve an effective skill without the integration of these two characteristics, and this integration may be the result of frequent use of the racket while playing and applying the skill [9].

Discussing the results of correlations between some combinatorial abilities and the accuracy of a crushing strike

The researcher attributes that speed is inversely proportional to accuracy. In addition, the sample is a beginner and does not have complete motor compatibility in distributing force with speed at the expense of accuracy.

In addition, the crushing blow skill is a complex and complex skill that involves a large group of muscles and joints, and each has a role in the success of this skill, and it requires high strength and speed if the player wants it [3].

Play it effectively so that it has an impact on the opponent, since speed and strength are inversely proportional to accuracy (increasing difficulty reduces speed and increases movement time, and when reducing movement time, speed increases and accuracy decreases) [10].

Also, agility is one of the basic physical abilities in playing the crushing blow, and any defect in the integration of skillful performance, which, in the opinion of the researcher, requires that the physical preparation be inclusive of all the necessary characteristics that play an effective role in implementing the technical and motor performance of the skill for beginners, especially those who do not possess many technical skills. And they lack the physical and functional competence required and necessary to perform these skills. Therefore, the emphasis is very necessary, through the results of the research, on the development of general and specific physical characteristics, which the researcher sees as the real key to the integration of the performance of basic skills in badminton. [12].

Conclusion

In conclusion, the researcher concluded

The study found a weakness in the physical and harmonic aspect of the research sample, which affects the accuracy of the frontal crushing strike of the badminton, and also the weakness of the physical and harmonic abilities negatively affects the accuracy of the frontal crushing strike of the badminton in the research sample.

The researcher also recommended

Emphasizing the development of training programs that work on the compatibility of the arm with the eye and the leg with the eye, and work on conducting research and similar studies on other samples and games.

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