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Research Article

Identify digital indicators according to tests designed to measure the accuracy and endurance of the combined skill performance of the for hand and back hand (straight and diagonal) for young tennis players

Assist. Prof.Dr Makki Jabbar Oudah
University of Basrah / College of Physical Education and Sports Science/Iraq.
Corresponding Author: gogomack1@gmail.com

Abstract

The research included the introduction and the importance of the research, through which the researcher deals with tests and measurement and its importance in the sports field, being one of the most important requirements for all sports, as it plays a prominent role in developing results in various events, especially tennis, and its characteristic in knowing the real levels For players, as the researcher has demonstrated the importance of the tennis game and its skills that need continuous evaluation and innovation of measurement methods and tests commensurate with the development in the game, therefore the importance of research lies in the design and codification of tests through which the skill performance of for hand and back hand and diagonal and diagonal strikes is measured. As for the research problem, it was represented in the fact that there is a dearth of tests that measure the endurance of the skill performance present in the sources are few and also presented these tests. As for the research objectives, they are:

1- Designing and coding tests to measure performance endurance and accuracy of for hand and back hand for young tennis players.

2- Finding the standard scores and levels for performance endurance tests and the accuracy of for hand and backhand.

The researcher used the descriptive method in the survey method to suit his research problem. As for the research sample, it was represented by (46) tennis players from the central and southern regions of Iraq for the sports season 2019/2020, who was chosen intentionally and included tools and means of collecting information, which is: Arab and foreign sources, tests and measurement, A metric tape for a stopwatch, features, and procedures for designing tests included presenting the tests to experts and specialists and then extracting the scientific foundations of the tests, which are validity, consistency and objectivity and then applying the tests to the sample number of (46) players and extracting grades and standard levels and thus the researcher reached the conclusions And one of the most important

1. The tests designed to measure the performance endurance are consistent with the level of the youth research sample in the game of tennis.
2. The appearance of the results for the research sample shows the great correlation between performance endurance and accurate skill performance in tennis

The most important recommendations are:

1. A Use of these tests to measure the combined skills performance of the tennis players.
2. Setting standard scores and levels for these tests, which can serve as a basis for evaluation and evaluation.

Keywords
Digital indicators, accuracy and combined skill

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Introduction

Skill measurement in most sports and activities deals with many aspects of motor behaviour that are related to actual playing situations and the proposed tests should interest the testers in order to perform as best they can and to achieve this, the tests must be similar to the activities you measure so that the testers do not alienate them, and this step requires Carrying out a skill or game analysis that is accurate and logical to verify the special skills, factors or components contained in the game or the skill that needs to be measured and scheduling the number of times and using each of the special skills in performance in the actual play situations during the application of the laws and rules organizing the game and the tennis game is one of Sports games that have benefited a lot from measurement and evaluation methods. Scientists and experts have devoted themselves to developing and building tests to measure physical abilities and basic skills to overcome the difficulties of skill and planning performance.[1] The basic skills in tennis are the basis for achieving high levels, and the player without it cannot implement the planned duties, as it contributes with the rest of the physical and psychological traits to raising the level of play as it is one of the games that need high physical fitness and physical effort with a focus to match the nature of the game. Given the importance of tests and metrics in all sporting events and because it is one of the main basic evaluation tools that have increased attention to,[2] so the researcher found that it is necessary to build special tests for the game and that the data obtained by using objective tests are accurate and crucial and give the ability to determine many of the basic measurement purposes that Serving workers in the sports field, and the presence of such tests in the research can help coaches of tennis players know the players 'skill levels and their preparations, define them and work to develop them.[3]

Indeed, the importance of the research lies in developing a complex set of tests commensurate with the age and requirements for the performance of this game, and therefore the ability to set indicators for the level of proficiency in skill performance.[4]

Tennis is one of the games that developed countries make continuous efforts to develop players and prepare them on scientific grounds to reach high levels as players vary in the degree of proficiency in skill performance and physical level in this game, as the level of performance in this game is the main pillar on which the side is built The skill is because it works to develop the level of performance and through the researcher's follow-up of studies and literature that have been written about this game, the researcher found there is a dearth of the existence of complex specialized tests to measure performance endurance in the areas of tests and measurement for this game as well as the speed of movement and the length of playing periods, whether at one point or in the game,[5] As well as looking for renewal in the development of tests commensurate with the development in the game of tennis, the researcher was obliged to find special tests for this game to measure the endurance of the physical and skill performance of tennis players as an indicator of complex performance.

Research objectives

1. Designing tests to measure the combined physical performance of the two skills of forehand, forehand, forehand and forehands, and for diagonal side, in the game of tennis.
2. Find standard scores and levels for the tests designed for tennis players.

Research fields

- The human field: Young tennis players in the central and southern regions of Iraq.
- Time field: Duration from 11/25/2019 to 5/2020
- Spatial field: private tennis courts for each governorate.

Research methodology and field procedures

Research Methodology

The researcher used the descriptive method in the survey method to reach the research goals. As surveys "mean the present and study the situation in greater depth while providing the researcher with detailed and analytical information".[6]

Community and research sample

The research community has been identified and they are young tennis players for the central and southern regions (2019) distributed over four provinces, Baghdad (18) player, Karbala (16) player, Maysan (6) player and Basra (12) player and the number (52) player, as for a sample The research included (46) players who were chosen in an intentional way, and (6) players were excluded from them for participating in the exploratory experience, and some of them were not prohibited to perform the tests. Thus, the percentage of individuals in the research sample reached (88.46%) from the research community.

Means of data collection and the tools used for research

The researcher used a set of research means to access the data of the research, namely:(Tests, registration forms, scientific sources and references, international information network). And the tools that will be used in the research are used, which are, rackets with tennis balls, tennis courts, a manual calculator, hp type laptop, 3 characters, stopwatch, coloured tape, and tape measure.

Steps to design the tests

Prepare the preliminary form of the tests and present them to the experts and specialists.

In order to reach the completion of the research requirements and after informing the researcher of many Arab and foreign sources and references available about designing and codifying the tests and what was stated in them in the accuracy of skill performance tests and performance endurance tests in the game of tennis, the researcher reached to formulate a new idea for the tests to measure the endurance of the physical performance of the complex for the strikes For hand and back, in-depth and diagonal, which were presented to experts and specialists, who confirmed their validity, and thus the tests were formulated in their final form, namely:

Designed tests

Basra University test to measure the endurance and accuracy of performance of the compound for hand and deep rear strikes[7]

The goal of the test: to measure physical performance endurance and accuracy of strikes
Tools used in the test: 3 people, tennis rackets,
(50) tennis balls, basketball, lap tape, chalk, stopwatch.
Conditions for applying the test: The backfield is divided into three sections
Equal in size (182 cm), and the area of the transmission boxes remains the same.

- (3) Triangles are placed in the form of a triangle at the end of the tested's stadium. The distance of each person from the other (1 meter).
- The tested performs a general and special warm-up before starting the test.

Method of performance: The tested stands at the end of the stadium and balls feeder (coach or assistant) near the right person to perform for hand strikes or near the left person if the test is for backhand and unfortunately if the player is easier and at the start of the test the tested performs

for hand or back strikes and performs the rear rotation around Tickets to return to the centre to perform the following strikes, and performance continues until the end of the specified time.

Score: The numbers of places where balls fall are recorded to take the value of the place where the balls fell (1, 2, 3, 4), and a zero is given to the failed balls, and when the ball falls on the line between two regions the score of the higher logic is calculated. Total tested score = sum of degrees of accuracy in 60 seconds.

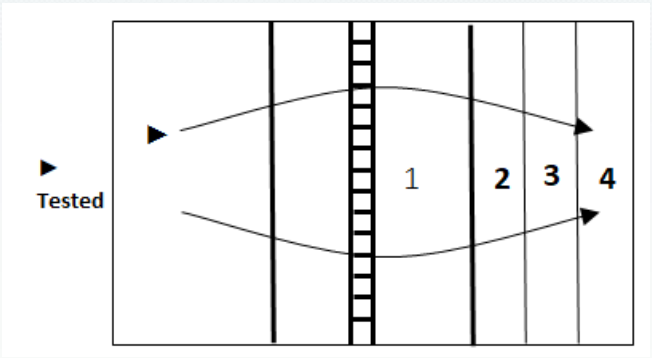

Figure 1. Show Basra University test to measure the endurance and accuracy of performance of the compound for hand and deep rear strikes

Basra University test to measure the endurance and accuracy of performance of the for hand and back diagonal strikes[8]

The objective of the test: to measure the physical performance endurance and accuracy of the compound for hand and backhand.

The tools used in the test: 1 person, tennis rackets, 50 tennis balls, and a basket of balls
Label tape, chalk, stopwatch, registration form.

Conditions for applying the test: The corresponding half-pitch is divided into three equal-length sections with a size of (137 cm).

- There are (2) persons placed in the corner from the end of the tested stadium. The distance of each person from the other (1.5 meters).
- The person is away from the sideline (1.5 meters) and the two people are away from the backline by a distance (50 cm).
- The tested performs a general and special warm-up before starting the test.

Method of performance: The tested stands at the end of the stadium and balls feeder (coach or assistant) near the right person to perform the forward diagonal strikes or near the left person if the test is for Qatari backhand and unfortunately if the player is easier and when starting the test the tested performs for hand or back strikes and spins back around the signs to go back to the beginning to perform the next hand, and the performance continues until the time limit is exhausted.

Score: The number of places where balls fall is recorded to take the value of the place where the balls fell (1, 2, 3), and a score of zero is given to failed attempts, and when the ball falls on the line between two regions the score of the higher logic is calculated

The overall score of the tested = the sum of the degrees of performance accuracy within 60 seconds.

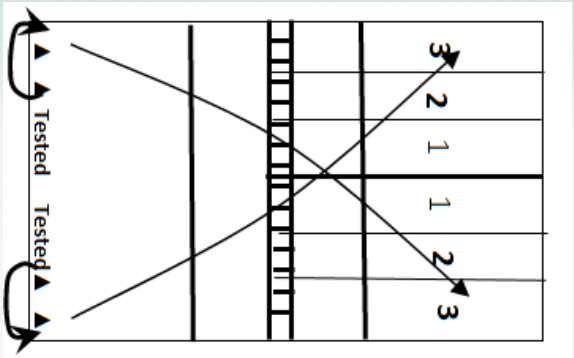

Figure 2. Show Basra University test to measure the endurance and accuracy of performance of the for hand and back diagonal strikes

Field research procedures

After preparing the tests in their final form, the researcher on Monday, 11/31/2019, and in the tennis courts in the College of Physical Education and Sports Science, University of Basra, using the help of (3) players representing the University of Basra in the tennis team with a field application of the tests and the goal was to determine the dimensions and distances For each test, as well as the place of placing the dimensions and their dimensions inside the stadium, the manner of performance in a manner commensurate with the research sample, how the scores are recorded and calculated, and the administrative organizations of tools and ancillary staff. An assistant or trainer throwing balls for the testers in the for hand and backstroke tests in a specific way and for each sample to unify the way the testers perform and give the tests the appropriate difficulty.

On Sunday and Monday on 8-9 / 12/2019, the tests were applied to (8) youth class players in Basra and (8) practising players from students of the College of Physical Education and Sports Science University of Basra and the aim was to obtain scientific transactions for the designed tests which Include validity, consistency and objectivity, and the tests were re-applied to young players after (7) days after the first application on Monday, 9/12/2019 to extract the stability factor.

Scientific coefficients for tests

The researcher extracted the scientific and appropriate treatments for the tests in the following manner:

Coefficient of validity

For the purpose of extracting the validity of the designed tests, the researcher calculated the discriminatory validity, which is one of the methods used to extract the validity, as this type indicates "the ability of the test to distinguish between two groups that are logically distinct in relation to the measured quality",[9] so the researcher applied the tests to two samples. Equal in number (8) players from the category of applicants and registered in the Basra Tennis Sub-Federation and (8) players practising the game of tennis (students of the Faculty of Physical Education). In order to calculate the differential validity, the results were processed using a test (t) as shown in Table (1).

Table 1.
Shows the mean, standard deviation, and calculated value (t) of the tests designed between advanced players and practising students

Tests	Advanced players		Practising students		(t) value	Type of significance
	Mean	SD	Mean	SD		
Performance endurance test and straight forward hand accuracy	26	3.07	15	2.00	2.966	Sig.

Performance endurance test and straight backhand accuracy	23.5	2.90	16.5	2.70	2.200	Sig.
Test performance endurance and accuracy of forwarding diagonal strikes	21.5	1.90	14.5	1.85	3.259	Sig.
Performance endurance test and accuracy of diagonal backhand	18.00	3.15	13	2.40	2.855	Sig.

* (t) tabular under the significance level (0.05) and degree of freedom (14) = (2.145)

It appears from the table that the calculated value (t) of the tests is greater than the tabular value of (0.767), which indicates that there are significant differences between the results of the tests for the two groups, as the differences between the two groups mean that they are different in features and capabilities. Therefore, the designed tests are true to the measured quality.

Coefficient of stability

The researcher used to calculate the stability coefficient of the test method and re-test with a time interval of (7) days. As the test was repeated for advanced players after the first application, and stability was found by calculating the correlation coefficient between the degrees of the first application and the degrees of the second application of the tests as shown in Table (2).

Table 2.
The coefficient of stability is shown between the first and second application of the designed tests

tests	The first application		Application after (7) days		(r) value	Type of significance
	Mean	SD	Mean	SD		
Performance endurance test and straight forward hand accuracy	26	3.07	27	2.90	0.820	Sig.
Performance endurance test and straight backhand accuracy	23.5	2.90	24	2.65	0.850	Sig.
Test performance endurance and accuracy of forwarding diagonal strikes	21.5	1.90	24	1.60	0.785	Sig.
Performance endurance test and accuracy of diagonal backhand	18.00	3.15	22.5	2.80	0.870	Sig.

Table value (r) below the significance level (0.05) and freedom degree (6) = (0.707)

Thus, the researcher obtained the stability of the test, as the value of the correlation coefficient was greater than the value of the tabulation, and this means that the results are close between the first application and the second application.[10] As indicates that the coefficient of stability reveals the stability (stability) of the test, ability or attribute Measured during a period of (3-7) days.

Objectivity factor

The objectivity is that "we describe the capabilities of the individual as they really exist and not as we want them to be."[11] since the tests designed in the research are clear, unambiguous, and far from self-evaluation, and registration is done using the grades shown in the tests, so these tests are considered to be Good objectivity.

Final implementation of the research tests

Four tests have been applied to withstand the physical performance, which is (46) players, and the researcher has observed the following points during the application:

1. Clarify the tests, the performance method, the goal of each test, and the method for calculating the scores.
2. Emphasizing the protective periods before performing the tests and giving experimental attempts to the tests.
3. The for hand and backstroke tests were started with depth, then the for hand and backstroke tests in Qatar, under the direct supervision of the researcher and the auxiliary work team. The implementation of the tests took from 20/12/2019 until 5/1/2020.

Statistical processing

The computer was used to calculate the following scientific transactions:(Mean, standard deviation and simple correlation coefficient Pearson using the statistical program (SPSS) and excel).

Results

Table 3.
Show mean standard deviation, and the torsion coefficient is shown for performance endurance tests and accuracy of forehand, deep and diagonal backhand in tennis

Tests	Mean	Median	Mode	SD	Skewness
Performance endurance test and straight forward hand accuracy X1	26.282	26.00	25	4.879	0.580
Performance endurance test and straight backhand accuracy X2	24.021	24.00	22	4.895	0.737
Test performance endurance and accuracy of forwarding diagonal strikes X3	20.76	20.00	20	4.233	0.707
Performance endurance test and accuracy of diagonal backhand X4	19.673	18.00	16	3.785	0.861

Through Table (3), we find that all the values of the torsional coefficient are less than 1, which means the good distribution of the sample and thus the possibility of extracting the standard grades for it.

Standard scores for designed tests

The results of the tests were statistically processed after the researcher obtained the data of the raw tests, mathematical mean, and standard deviations, and these scores are without indication to compare these scores for the sum of the vocabulary of the test, which requires the conversion of those scores to standard scores which is "a way to determine the relative state of the raw scores, and therefore these can be explained Grades and evaluating their results ".[12] Therefore, the researcher used the method of modifying standard grades sequentially to extract the standard grades after extracting the relationship for finding the fixed amount for each test and using it later in setting tables for the standard scores for the tests.

Sequentially adjusted standard score = mean ± constant value
constant value= 5 * SD /5 (12: 1981: 317) as in Table (8)

Display the levels of tennis players in performance tests and the accuracy of for hand and backhand

Table 4.
Shows the standard levels and their ratios in the normal distribution curve, raw scores, adjusted scores in the sequence method, the number of players, and the percentages for each level in the endurance test and accuracy of the straight forward hand of tennis players

Standard levels and their proportions in the normal distribution curve	Raw grades	Relative standard scores	Number of Players	Percentage
Very good	41.1279 - 50.227	81 – 100	/	/
Good	31.5499 - 40.649	61 – 80	8	17.39%
Average	21.9719 - 31.071	41 – 60	32	69.565%
Acceptable	12.3939 - 21.493	21 – 40	6	13.043
Weak	11.915 and below	1 – 20	/	/

Through table (4) it is clear to us the levels achieved by the sample in tests of bearing performance and accuracy of forwarding strikes in-depth, we find that the largest number of players was at the level (average) as the number of players (32) and the lowest number was at the acceptable level and the number of players in it (6) While the sample did not achieve any percentage mentioned in the level is very good or in a weak level.

Table 5.
Shows the standard levels and their ratios in the normal distribution curve, raw scores, modified scores in the sequence method, the number of players, and the percentages for each level in the endurance test and the accuracy of the straight backhand of tennis players

Standard levels and their proportions in the normal distribution curve	Raw grades	Relative standard scores	Number of Players	Percentage
Very good	39.1955 - 48.469	81 – 100	/	/
Good	29.4055 - 38.706	61 – 80	11	23.913%
Average	19.6155 - 28.916	41 – 60	26	56.521%
Acceptable	9.8255 - 19.126	21 – 40	9	19.565%
Weak	9,336 and below	1 – 20	/	/

Through table (5) it is clear to us the levels achieved by the sample in tests of bearing performance and accuracy of backhand in-depth, we find that the largest number of players was at the level (average) as the number of players (26) and the lowest number was at the acceptable level and the number of players in it (9) While the sample did not achieve any percentage mentioned in the level is very good or in a weak level.

Table 6.
Shows the standard levels and their ratios in the normal distribution curve, raw scores, modified scores in the sequence method, the number of players, and the percentages for each level in the endurance test and accuracy of the forward diagonal strikes for tennis players

Standard levels and their proportions in the normal distribution curve	Raw grades	Relative standard scores	Number of Players	Percentage
Very good	3.8823 – 41.925	81 – 100	/	/
Good	25.4163 – 33.459	61 – 80	9	19.565%
Average	16.9503 – 24.993	41 – 60	31	67.391%
Acceptable	8.4843 – 16.527	21 – 40	6	13.043%
Weak	8.061	1 – 20	/	/

Through table (6) it is clear to us the levels achieved by the sample in tests of bearing performance and accuracy of forwarding diagonal strikes, so we find that the largest number of players was at the level (average) as the number of players was (31) and the lowest number was at an acceptable level and the number of players in it (6) While the sample did not achieve

any percentage mentioned in the level is very good or in a weak level.

Table 7.
Shows the standard levels and their ratios in the normal distribution curve, raw scores, modified scores in the sequence method, the number of players, and the percentages for each level in the endurance test and the accuracy of the diagonal background strikes for tennis players

Standard levels and their proportions in the normal distribution curve	Raw grades	Relative standard scores	Number of Players	Percentage
Very good	30.4065 - 41.925	81 – 100	/	/
Good	22.8365 - 30.028	61 – 80	9	19.565%
Average	15.2665 - 22.458	41 – 60	29	63.043%
Acceptable	7.6965 - 14.888	21 – 40	8	17.391%
Weak	7.318 and below	1 – 20	/	/

Through table (7), the levels achieved by the sample are clear to us in tests of performance endurance and accuracy of diagonal backhand, so we find that the largest number of players was at the level (average), as the number of players (29) and the lowest number was at the acceptable level and the number of players in it (8) While the sample did not achieve any percentage mentioned in the level is very good or in a weak level.

Discussion

In light of the results and levels reached by the researcher, we find that most of the players were within the average level in the for the combined skill test all of them and the researcher explains that because the players are young and they lack field experience in playing that helps them to complete the requirements of the complex skill performance well, especially with the designed tests By the researcher, which is similar to the skilful performance in competition, and this is what he refers to ,[13] as "previous experiences of information and knowledge acquired by the individual athlete during the skilful and planning learning processes and during his recovery in mathematical competitions are applied to apply what he has learned and acquired from the most important factors That direct the player's skilful performance. Because it is characterized by the speed and accuracy of skill performance, it is imperative that the training of players be in accordance with the disciplines and duties of the game skill and planning, and this is confirmed by ,[14] as "applied studies and research showed that the best way to train on events is training on the characteristics, duties and skills of the game itself This guarantees the progress of the physical, skill, and tactical level, and the nature of the tennis game and the basic conditions it needs to control and master the movement of the feet to move inside the stadium, therefore, attention must be paid to training on how to move the feet and perform the correct movements in order to ensure the benefit of the opposing force transferred as a result of the reaction of the ground and because of payment The body has an increased strength of strikes, and this is done through the good timing of the movement of the feet with the striking hand and the rest of the body parts .[15]
The researcher also believes that the game needs to integrate the general and special physical attributes, which is a reflection of the level of physical and skill competencies of the players, especially in the game of tennis, as it needs long periods in order to reach the good athletic level "as it is necessary to emphasize fitness training with exercises Tactics and technique because every skill needs it, as physical preparation aims to develop physical attributes such as strength, endurance, speed, and agility ,[16] and the tests designed by the researcher largely depend on the players 'ability to perform the skill, structural capabilities, and the results of the study confirm The effectiveness and level of the members of the research sample, and that the tests are effective in estimating the levels of players in terms of physical and skill (complex). This is what he indicated .[17] "The athlete's competence and level depend mainly on his ability to perform and through which his physical ability and mastery of skills are achieved. The vehicle, as well as its mental ability and readiness of the player to perform "as indicated by " The basic

motor skills of the game, are among the most important and most sensitive factors because the Physical,[18] planning, and psychological preparation has no value without motor skills. The player who was physically prepared and no longer skilled cannot use his physical capabilities to control performance.

Conclusions

The researcher concluded from the current study to:

1. The tests designed and codified to measure the endurance and accuracy of the combined skill performance in the tennis game are compatible with the level of the applicants' research sample.
2. Most of the test results and all the researched skills fall within an intermediate level and a few fall within a good and acceptable level.
3. The appearance of the results for the levels of the research sample shows the great correlation between performance endurance and the accuracy of skill performance in tennis.

Recommendations

1. Use these tests to measure the skill performance of tennis players.
2. Setting standard scores and levels for these tests that serve as a basis for evaluation and evaluation.
3. A change in the level (ease or difficulty) of the test commensurate with the sample for which it is designed after conducting scientific transactions for it.

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