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Forecasts some of functional indicators nervous system for dribbling skills in young basketball players from Baghdad Governorate

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Abstract.

The research study is important since it establishes predicted rates for various nervous system functional indicators. In terms of performing the skill of Dribbling in basketball for young players in Baghdad Governorate in order to reach scientific results that serve researchers, coaches, and players uniformly.

The study's goal is to create predictive equations for specific functional indicators of the nervous system in relation to the Dribbling skill performance of young basketball players in Baghdad Governorate.

The researchers used a descriptive approach with a survey method on (8) youth basketball league clubs in Baghdad Governorate for the 2022-2023 sports season, totaling (96) players. Three tests were used to measure the nervous system, and one test was used to measure the basketball dribbling skill. After processing the data statistically, the researchers concluded that there was a contribution rate for the Romberg test (maintaining balance) as an indicator of the nervous system in terms of the performance of the dribble skill in basketball for young players by (3.5%), a prediction equation was developed for it. There is a contribution rate for the Yarotsk test (evaluation of the state of the vestibular system) as an indicator of the nervous system in relation to the performance of the basketball dribbling skill for young players by (5.6%), and a prediction equation was developed for it. The researchers recommended the need to direct coaches and specialists to pay attention to the results of this study in planning future programs to develop the true performance level of young basketball players. It is necessary to circulate the results of this study to sports and youth centers and sports clubs in order to rely on the tests used to judge the suitability of players to practice basketball. It is necessary to conduct similar studies on functional indicators of the nervous system and try to determine the percentage of their contribution in relation to other basketball skills that were not addressed in the current study and to establish predictive coefficients for them. It is necessary to conduct similar studies on functional indicators of the nervous system in relation to the performance of the basketball skill at other levels and for both genders.

Keywords. Forecasts, Nervous system, Dribbling, basketball skills

introduction

Basketball is one of the team sports that is known to take a lot of skill, function, physicality, and strategy to develop. Being a fast-functioning and exhausted game due to the nature of its continually mobile and continuous performance, save for legal breaks that occur in accordance with the rules of play. Identifying the functional status of a young basketball player is an important issue in the success of skill performance as it is one of the important necessary factors for performing offensive skills in basketball.

Also, the requirements of the game of basketball require functional variables for the nervous system that enable the emerging player to perform well during the game, which contributes effectively to the skillful performance of the dribble skill to be a guide for evaluating the athletic level and determining the proper selection of players who contribute to the level of development of the game.

The research is important because it establishes prediction coefficients for several nervous system functional markers in relation to how well young basketball players in the Baghdad Governorate perform the dribbling skill. Scientific results are reached that serve researchers, coaches, and players. Both

The research problem stems from the fact that, as far as the researchers are aware, no study has examined functional indicators of the nervous system and attempted to calculate the percentages of their contribution to the execution of any fundamental basketball skill, offensive or defensive, nor have there been any predictive equations developed for them. The researchers decided to study and interpret a topic that aroused their interest in knowing the prediction of some functional indicators of the nervous system in relation to the performance of the basketball skill of dribble by young players in Baghdad Governorate. The goal of the study is to create predictive formulas for a few nervous system functional indicators in relation to how well young basketball players in the Baghdad Governorate execute the dribble skill. Tests were held from February 26 to March 24, 2023.

Methods

The researchers used the descriptive survey method to suit the objectives of the study. The research community comprises of eight (8) youth basketball league clubs from Baghdad Governorate that compete in the 2022-2023 sports season, They are clubs (Police, Oil, Tigris University, Al-Hashd, Electricity, Air Defense, Air Force), All clubs were deliberately chosen, with (96) players representing 100%. (6) Players from the Degla University Club were chosen as a reconnaissance sample but were not excluded from the work sample.

The researchers used the following methods, devices, and tools: (personal interviews, scientific sources and references, tests and measurement, the International Information Network (the Internet), a device to measure the pulse, a chair with a recliner, a bed for the subject to lie down, a medical scale to measure weight, Manual scientific calculator, Sharp type, GENX flash ram, Pentium 4 computer, 2 diamond stopwatches, 6 legal basketballs, whistle (2), number signs (4), legal basketball goal, Expert opinion poll questionnaire on identifying the most important tests for functional indicators of the nervous system of young basketball players, expert opinion poll questionnaire on identifying the most important tests to measure the basketball dribbling skill of young basketball players).

Results and discussion

First Determine the functioning tests for the nervous system:

1. Ashner Test (eye-cardiac reaction) (Abdel-Fattah and Hassanein, 1997, p. 183)
2. Romberg Test (maintaining balance) (Abdel Fattah and Hassanein, 1997, p. 167).
3. Voyatchk Test (Abdel Fattah and Hassanein, 1997, p. 170).
4. Yarotsk Test (Abdel Fattah and Hassanein, 1997, p. 171).
5. Horizontal Space Test (Abdel Fattah and Hassanein, 1997, p. 179).
6. Vertical Space Test (Abdel Fattah and Hassanein, 1997, p. 179).

The researchers presented a questionnaire form to survey the opinions of experts in the field of physiology, testing, measurement, and basketball to determine the most important functional tests of the nervous system for young basketball players. After collecting and transcribing the data, the percentage of each functional test of the nervous system was calculated, and tests that received a percentage of less than (25%) were excluded. “A specific percentage can be determined, less or greater than 25%, which the researcher chooses according to a certain point of view” (Majeed and Salman, 1992, p. 19). Thus, the work settled on the following final tests: (Ashner’s test (eye-heart reaction), Romberg test (maintaining balance), Yarotsk test) as in Table (1).

excluded	percentage	Total marks	Functional variables of the nervous system	T
	%100	15	Ashner's reaction eye-cardiac test	1
	%100	15	Romberg test (maintaining balance)	2
×	%20	3	Voyacek test	3
	%80	12	Barotsk test	4
×	%20	3	Test the sensation of horizontal linear space	5
×	%13.33	2	Testing the feeling of emptiness, the vertical line, emptiness, criticism	6

Table (1).
 Percentage of functional tests of the nervous system

Second the skill tests for the basketball dribbling skill:

1. Dribbling between four barriers for (45) seconds (Abdel Dayem and Hassanein, 1999, p.

105).

2. Negotiating between obstacles (Abdel Dayem and Hassanein, 1999, p. 129)
3. Speed when dribbling with the ball (Allawi and Radwan, 1987, pp. 363-364)

Then the researchers presented a questionnaire form to poll the opinions of experts in the field of testing, measurement, and basketball to determine the most important skill tests to measure the dribble skill in basketball for young players. After collecting and transcribing the data, the percentage for each skill test was calculated, and the tests that received a percentage less than (25%) were excluded. Thus, the work settled on testing the bump between four barriers for (45) seconds, as in Table (2).

excluded	percentage	the total number	Tests	ت
	%100	15	Dribbling between four barriers for (45) seconds	1
×	%0	0	Negotiating between obstacles	2
×	%0	0	Speed in dribbling the ball	3

Table (2). Percentage of skill tests to measure basketball dribbling skills

Scientific foundations for nervous system tests and basketball dribbling skill tests:

On February 28, 2023, the researchers conducted an exploratory experiment on six players from the Degla University Basketball Club to check scientific transactions (honesty, consistency, and objectivity).

honesty

The researchers used the method of questionnaire forms that were distributed to experts and specialists to seek their opinions in determining the most important functional tests for the nervous system and the dribble skill in basketball for young players, according to what was mentioned (Thaer Daoud Salman 2020 AD) ، As a result, content validity was attained. According to Al-Qaisi (2020, p. 25), content validity "The goal is to know the extent to which the test or scale represents aspects of the trait, trait, or period to be measured, and whether the test or scale measures a specific aspect of this phenomenon or measures it completely." The content validity of every test that is nominated for application is verified by researchers.

Consistency

As stated in (Thaer Daoud Salman 2020 AD), "its ability to provide the same or similar effects if administered to the same individuals and in similar situations. If the same person gets the same score on the same test multiple times, the test is considered to be on the same level." A high degree of stability" (Al-Qaisi, 2020, pp. 185–186)

The researchers calculated the stability of the functional tests of the nervous system and the skill of Dribbling in basketball using the (test and retest) method by conducting a reconnaissance experiment on (6) players from the Degla University basketball club, and using the simple correlation coefficient (Pearson) between the scores of the first and second measurements, it was concluded that All tests had high reliability because all of their calculated values had a significance level (Sig) smaller than the value of the approved significance level (0.05) (Al-Qaisi, 2020, p. 29) as in Table (3).

objectivity

In order to identify the objectivity of the functional tests of the nervous system and the basketball striking skill of young players, the value of the simple correlation coefficient (Pearson) was calculated between the scores of the first and second referees, as objectivity means "there is no difference between the evaluators in judging something or a specific topic" (Mustafa, 2001, p. 50), and it was concluded that all tests were highly objective due to the fact that the values of the significance level (Sig) were smaller than the value of the approved significance level (0.05) as in Table 3..

indication	Sig	Objectivity	indication	Sig	Consistency	Tests	ت
D	0.000	0.887	D	0.000	0.823	Ashner's reaction eye-cardiac test	1
D	0.000	0.892	D	0.000	0.811	Romberg test (maintaining balance)	2
D	0.000	0.899	D	0.000	0.834	Yarotsk test	3
D	0.000	0.901	D	0.000	0.821	Dribbling between four barriers for (45) seconds	4

Table 3
 Represents the reliability and objectivity of nervous system tests and skill tests Basketball dribbling

The

Main

Experiment

Before starting the main experiment, the researchers established the homogeneity of the sample in all functional tests of the nervous system and in the basketball dribbling skill test for young players by extracting the values of the means, standard deviations, median values, and values of the skewness coefficients for all of them, as in Table (4), and it was concluded that All values of the skewness coefficients were less than (± 3), which indicates the homogeneity of the sample and its good distribution. The researchers conducted the main experiment on 2/3/220 and to 28/3/2203 on the sample of the research and the players of the Youth League basketball in Baghdad and subscribers in the sports season 2022-2023m By applying all the functional tests of the nervous system and testing the skill of dodging the basketball and one day for each club at its internal skill and in the closed people, and after all the tests for all clubs were audited in order to be addressed statistically To reach the final results to achieve the objectives of the study.

Torsion coefficient	Mediator	Standard Deviants	arithmetic mean	U OF M	Tests
0.838	2.00	1.002	2.28	beat	Ashner's reaction eye-cardiac test
0.118	17.00	3.300	17.13	second	Romberg test (maintaining balance)
0.496	40.00	3.321	40.55	second	Yarotsk test
0.026-	26.00	4.600	25.96	point	Dribbling between four barriers for (45) seconds

Table 4

It shows the homogeneity of the research sample in the nervous system tests and the skill test Basketball dribbling

The ready-made program (IBM SPSS Statistics Ver 25) was used to extract (arithmetic mean, **standard deviation**, Median, coefficient of skewness ,percentage , **Pearson correlation coefficient** , multiple linear regression Stepwise method.

Results of the nervous system indications are displayed with shuffling Using Pearson's simple correlation coefficient, the relationship between all nervous system markers and basket dribbling ability was determined. This resulted in a matrix of correlation coefficients that is shown in Table (5). It is noted that the matrix includes (6) correlation coefficients (diagonal cells were not counted), including (2) significant correlation coefficients with a ratio of (33.333%) because their significance level values were smaller than the approved significance level (Sig) values of

(0.05).

And (4) non-significant correlation coefficients of (66.666%) also because their significance level values were greater than the approved significance level (Sig) values of (0.05).

Dribbling	Yarotsk	Romberg	Ashner	Variables
*0.712	0.127	0.62-	1.000	Ashner
*0.660	0.230	1.000		Romberg
0.137	1.000			Yarotsk
1.000				Dribbling

Table (5)

Matrix of intercorrelation coefficients for nervous system indicators with Dribbling basketball

Logical analysis of multiple linear regression of nervous system indicators in relation to dribbling skill performance

Using dribbling as a dependent variable, the researchers used multiple linear regression using the Stepwise method to extract the percentage contribution of nervous system indicators to the performance of the basketball dribbling skill of young players, as shown in Table (6).

percentage	value T	Beta factor	Value F	The slope of the regression line	Fixed amount	coefficient of determination	Multiple correlation coefficient	Requirements	form
%2.9	1.683 *0.040	0.171-	2.831 *0.001	0.785	27.749	0.029	0.171	Ashner	First
%3.5	1.722 *0.006	0.176-	1.694 *0.003	0.807	29.638	0.035	0.187	Ashner	Second
	1.755 *0.005	0.077		0.107				Romberg	
%5.6	1.888 *0.026	0.193-	1.836 *0.003	0.885	20.528	0.056	0.238	Ashne	Third
	1.416 *0.045	0.043		0.160				Romber	
	1.442 *0.007	0.151		0.209				Rutsk	

Table (6)

It shows the percentage of contribution of nervous system indicators to the skill of Dribbling

The results of the multiple linear regression analysis shown in Table (6) showed that the percentage contribution of nervous system indicators to the performance of the basketball dribbling skill was as follows

1. The first test: Ashner (eye-cardiac reaction): The multiple correlation coefficient was (0.171), the regression coefficient (determination) was (0.029), and the constant value was (27.749), while the calculated (F) value was (2.831) at a significance level of (0.001), which is significant because it is less than the approved significance level (< 0.05) while the calculated (t) value was (1.683) at the significance level (0.040), which is significant because it is less than the significance level (< 0.05) and the value of the beta coefficient (-0.171). This variable achieved a contribution rate of (2.9%).

Based on the data, the prediction equation for dribble skill in terms of the Ashner test (eye-cardiac reaction) is:

$$\text{Dribbling} = 27.749 + (0.785 \times \text{Ashner's test})$$

second test: Aschner (eye-cardiac reaction) and Romberg (maintaining balance)

The multiple correlation coefficient was (0.187), the regression coefficient (determination) was (0.035), and the constant value was (29.638), while the calculated (F) value was (1.694) at a significance level of (0.003), which is significant because it is less than the approved significance level (< 0.05). While the calculated value of (t) reached (1.722, 1.755) at the level of significance (0.006, 0.005), which is significant because it is less than the level of significance (< 0.05) and the value of the beta coefficient, respectively (-0.176, 0.077). This variable has a contribution rate of (3.5%),

Based on the data, the prediction equation for dribbling skill in terms of the Achner test (eye-heart reaction) and the Romberg test (maintaining balance) is:

$$\text{Dribbling} = 29.638 + (0.807 \times \text{Ashner test}) - (0.107 \times \text{Romberg test})$$

The third test: Ashner (eye-cardiac reaction), Romberg (maintaining balance), and Yarotsk (evaluation of the vestibular system):

The multiple correlation coefficient was (0.238), the regression coefficient (determination) was (0.056), and the constant value was (20.528), while the calculated (F) value was (1.836) at a significance level of (0.003), which is significant because it is less than the approved significance level (< 0.05) while the calculated (t) value was (1.888, 1.416, 1.442) at a significance level of (0.026, 0.045, 0.007), which is significant because it is less than the significance level (< 0.05) and the value of the beta coefficient, respectively (0.193, 0.043), 0.151), This variable achieved a contribution rate of (5.6%), and this variable achieved a contribution rate of (5.6%),

and from the data, the prediction equation for dribbling skill is in terms of the Achner test (eye-heart reaction), the Romberg test (maintaining balance), and the Yarotsk test (evaluating the condition of the system). vestibular) are:

$$\text{Dribbling} = 20.528 + (0.885 \times \text{Ashner's test}) - (0.160 \times \text{Romberg's test}) - (0.209 \times \text{Yarotsk})$$

Discussion:

It is clear from Table (6) that the stepwise regression resulted in the ranking of all variables without deleting any of them. Also, the most important determinants of the nervous system indicators represented by the Ashner test (eye-cardiac reaction), The Romberg test (maintaining balance) and the Yarotsk test (evaluating the condition of the vestibular system) have significant contribution rates in terms of the performance of the basket dribbling skill, with a contribution rate of (5.6%). Researchers believe that reconnaissance through the eyes while performing the skill of dribbling in basketball leads to reactions in the neck muscles caused by the position in which the head is as a result of watching, and that any imbalance in the position of the head leads to disruption of the reactions and imbalance, which affects the accuracy of the dribbling performance, which means This defect will accompany the motor path, The result reached by the researchers is consistent with what was indicated by (Manahil Abdel Hamid, 2006), citing (Kurt Meinel, 1987), “Rotational movements are led and stopped in general through head movements” (Daoud, 2006, p. 127), and it also agrees with What was indicated by (Manahil Abdel Hamid 2006 AD) quoted by Kurt Meinel 1987 AD) is that “the movement of the head precedes the movements of the torso in many cases due to reconnaissance by looking at the goal of the movement or its new direction.” This goal or direction is seen with the eye before the body reaches it” (Daoud, 2006, p. 94). Researchers also believe that regular training in basketball dribbling skills for young players will lead to reaching a stage of stability or skill mastery, meaning that players will be able Performing the dribbling skill smoothly and with few errors, which leads to improved neuromuscular coordination. The result reached by the researchers is consistent with what was indicated by (Abdullah Huwail 2008), citing (Grosser 1995), “that the joint work between the nervous and muscular systems according to the scope of voluntary movement involves the various areas of the central and physical nerves, in addition to the development of psycho-mental qualities, and both of them are considered It is one of the requirements for mastering the art of motor performance” (Al-Kaabi, 2008, p. 82), and it agrees with what was stated by (Muhammad Hassan and Abu Al-Ala Ahmed 2000 AD) “The relatively low heart rate, which is accompanied by a relatively large stroke volume, is one of the indicators of the efficiency of the circulatory system as well. “Slow heart rate at rest is a characteristic of trained people” (Allawi and Abdel Fattah, 2000, p. 114), The researchers also believe that the contribution of the Ashner test (eye-cardiac reaction) to the accuracy of performing the basketball dribbling skill is consistent with the findings of (Thaer Dawood & Ghusoon Natiq 2022) “that there is a significant correlation between the Ashner test (eye-cardiac reaction). With the level of shooting accuracy (Thayer & Ghusoon: 2022, 10831)), the researchers also believe that a visual reaction with a very short duration leads to achieving better performance when performing the skill of dribbling in basketball, as a result of the reflection of mental processes and the player’s response to stimuli that depend in a way on the sense of sight, which transmits to the brain the distance between it and the ground during dribbling. The brain works to analyze and study the information received from the visual system, then sends the execution command through the nervous system, which in turn transmits this information to the muscular system to carry out the motor task. The result reached by the researchers is consistent. With what (Thaer Dawood & Ghusoon Natiq 2022) pointed out, citing (Wajih Mahjoub 1989) “that in the sensory

skill there is movement, but the decisions made regarding testing the movement are important, and this depends on the reaction, the importance of which varies from one skill to another.” It also develops through training and practice and also depends on the ability of the senses to receive stimuli” (Salman & Abdul Hameed, 2022, p. 10834). The researchers also believe that the importance and contribution of the Romberg test (preserving balance) and the Yarotsk test (evaluating the condition of the vestibular system) in the accuracy of performing the basketball dribbling skill for young players is conclusive evidence of the importance of the balance element in achieving stability for the body of basketball players, especially in the dribbling skill. Which results from the states of stability and movement, so balance must receive the attention of basketball coaches and train their players on it in order to reach high stability of the player’s body and thus reach the accuracy of dribbling performance in basketball. The result reached by the researchers is consistent with what (Mustafa Abdel) indicated. Al-Karim 2001 AD) quoted from (Wajih Mahjoub 1989 AD) “The sense of balance is linked to the development of the nervous system, and that balance is related to the economy of effort and the development of agility, and that the quality of balance is linked to neuromuscular coordination” (Mustafa, 2001, p. 71), and it matches what you mentioned. (Ghossoun Natiq, 2004) “The vestibular system is responsible for the process of balancing the body and the ability to move the body in space, and this is linked to the development of the senses” (Abdul Hamid, 2004, p. 85).

Conclusion

1. It was found that there is a contribution rate of the Ashner test (reaction eye-cardiac) as an indicator of the nervous system with the basketball dribbling skill of young players in Baghdad Governorate, amounting to (2.9%).
2. It was found that there is a contribution rate for the Romberg test (maintaining balance) as an indicator of the nervous system with basketball dribbling skill for young players in Baghdad Governorate, amounting to (3.5%).
3. It was found that there is a contribution rate for the Yarotsk test (evaluation of the state of the vestibular system) as an indicator of the nervous system with the basketball dribbling skill of young players in Baghdad Governorate, at an amount of (5.6%).

4. (3) predictive equations were reached for some nervous system indicators in relation to dribbling skill performance

$$\text{First / Dribbling skill} = 27.749 + (0.785 \times \text{Ashner test})$$

$$\text{Second / Dribbling skill} = 29.638 + (0.807 \times \text{Ashner test}) - (0.107 \times \text{Romberg test})$$

$$\text{Third / Dribbling skill} = 20.528 + (0.885 \times \text{Ashner test}) - (0.160 \times \text{Romberg test}) - (0.209 \times \text{Yarotsk})$$

Recommendations

1. It is necessary to direct coaches and specialists to pay attention to the results of this study in planning future programs to develop the real performance level of basketball players in the associated league clubs.

2. It is necessary to circulate the results of this study to sports and youth centers and sports clubs in order to rely on the tests used to judge the suitability of players to practice basketball.
3. The necessity of conducting similar studies on functional indicators of the nervous system and trying to determine the percentage of their contribution to other basketball skills that were not addressed in the current study and establishing predictive equations for them.
4. The necessity of conducting similar studies on functional indicators of the nervous system with basketball dribbling skill and at other levels and for both sexes.
5. The predictive equations reached in the current study will serve coaches and referees at the level of players in the future.

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