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Predicting the Performance of Certain Fundamental Skills Based on Selected Physical Tests for Young Football Players in Mosul Academies

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ABSTRACT

The measurement process in physical education and sports sciences, which focus on motor behavior, is more complex than in other sciences due to internal and external factors' significant and immediate influence on humans. Consequently, there is growing interest in tests essential to life, work, and performance. This study aims to establish predictive equations for skill tests based on several physical tests for young football players in the Mosul city academies. The researchers used a descriptive correlational method as it suits the nature of the research problem. The research sample consisted of young players, totaling (96), after excluding the pilot experiment sample, the reliability, and the players absent from the tests, which amounted to 74 players. Thus, the research sample represented (56.47%) of the total population of the study. The results of this work show that the physical tests used in the research contributed significantly to the results of the dribbling and passing skill tests, which underscores the importance of the physical tests in assessing the dribbling and passing skills of young football players in the academies of Mosul City. In conclusion, the research concluded that physical tests are effective for young players in the Mosul City academies.

Keywords: Physical, Dribbling, Passing, Tests

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INTRODUCTION

The measurement process in physical education and sports sciences, which deals with motor behaviour, is more complex than in any other science (Gao et al., 2021). Internal and external factors significantly and instantly influence humans. Therefore, interest has increased in tests that play a significant role in various areas of life, work, and performance. The test aims to establish programmed work as an evaluative tool that helps diagnose areas of weakness and strength (Weinberg & Gould, 2023). Proper planning or progress toward improvement can only

occur based on accurate evaluation. It can only be achieved through objective testing and scientific measurement. Tests are considered a tool for objective evaluation in the sports field (Chaabene et al., 2018). They greatly benefit coaches by enabling them to improve training efficiency (Chaabene et al., 2018). Tests are typically based on principles that define their objectives, content, and methods of implementation, which in turn help us evaluate physical and skill performance and compare levels to set goals (Weinberg & Gould, 2023). The extent to which performance aligns with the objectives is determined, which given the importance of tests and measurements in all sports, which serve as the basis for evaluation. Data and information obtained through objective and decisive measurements and tests provide the ability to determine many fundamental purposes of measurement in diagnosis, classification, and scientific research (Kraemer et al., 2012). Through them, it is possible to identify points of deficiency, find appropriate solutions to address these issues and evaluate the adopted programs. (Al-Zubair, 2019).

Tests and measurements are essential scientific tools in physical education and sports sciences (Williams & Lacy, 2018). They play a prominent role in proper planning and sustaining progress. Objective testing and precise scientific measurement play a major role in accurately indicating a player's abilities (Kansal, 2021). Therefore, it is essential to utilize these tools to advance sports activities in general and in the sport of volleyball in particular.

Moreover, these tests and measurements, which are developed and standardized for specific communities, are sometimes not the optimal tools for measuring the abilities of individuals and athletes (McGuigan, 2017; Fukuda, 2019). Therefore, it is better to develop tests that align with the actual abilities of players during gameplay. It is essential to find tests and standards suitable for our players and their capabilities on the field to assist both the player and the coach in evaluating performance and diagnosing any weaknesses or deficiencies that may exist.

Football is a team sport that requires those in charge to study all its aspects, particularly the skill aspects, due to their importance for the football player. It is essential to develop these fundamental skills and link them to the players' physical attributes (Morris-Eyton & Roux, 2019).

Tests and measurements in team sports are among the most effective evaluation tools in motivating players to learn and train in an effort to help them reach the highest athletic levels (Williams, Lacy, 2018). The results indicate the player’s performance level in a specific skill. The player’s awareness of the level they have reached helps them reinforce successful responses and attempt to correct and avoid mistakes. It also contributes to comparing the player’s progress with themselves or with other players. (Abu Zaid, 2007).

The current research is important in identifying the impact of certain physical tests on the performance of fundamental skills tests for young football players in the academies of Mosul City.

Research Problem

Various tests and measurements are used in physical education and sports sciences in general to assess different aspects of motor, skill, tactical, or psychological performance. These tests and measurements are typically constructed for a specific sample and cannot be applied to samples other than the one on which they were developed.

The research problem for the researchers focuses on answering the following question: Do the results of physical tests affect the results of skill tests, and what is the level of this impact based on contribution ratios and the prediction of skill test results as determined by several physical tests for young football players in the academies of Mosul city?

Research Objectives

The current research aims to: Establish predictive equations for skill tests based on several physical tests for young football players in the Mosul city academies.

METHODS

The researchers used the descriptive correlational method due to its suitability for the nature of the research problem.

Population and Sample of Study

The research population consisted of young football players from the Nineveh Academies participating in the Nineveh Academies Football Union competitions, aged 16 to 19 years, for the 2023/2024 sports season. The total number of players is 170, representing 10 academies. The research sample consisted of young players totaling (96), after excluding the sample for the pilot study, reliability, and absent players, who numbered (74). Thus, the research sample represented (56.47%) of the total research population. Table (1) shows the research population and its sample.

Table 1. Distribution of the total research population and sample

No.	Academies	Total population	Total sample	Excluded	%
1	Degla	16	8	8	
2	Al-Tahrir	18	12	6	
3	Al-Aneg	15	8	7	
4	Al-Sharjah	17	4	13	
5	An Numaniyah	15	10	5	
6	Al-Olympic	18	14	4	
7	Mosul Club	23	21	2	
8	Al-Za'eem	14	6	8	
9	Al-Sukar	18	8	10	
10	Al-Quds	16	5	11	
	Total	**170**	**96**	**74**	**56.47**

Table 2. Details of the research sample

Sample	No.	%
Main sample	96	%56.47
Reliability	20	%11.76
Pilot experiment	10	%5.89
Excluded	44	%25.89
Total	**170**	**%100**

Data and Information Collection Methods

To obtain results that serve the researcher, the researcher utilized several data collection methods: questionnaires, skill tests, and physical tests.The researchers prepared a questionnaire form to gather the opinions of experts and specialists in measurement and evaluation to identify the validity of the skill tests, which included 4 specific skill tests, and the physical tests, which included 5 tests. After distributing the questionnaires to the experts and specialists and collecting and analyzing the responses, this process resulted in the acceptance of the skill and physical tests, as shown in Table 3. This will also be clarified in terms of face validity. The researchers identified 4 skill tests to measure the fundamental skills of football players, as well as 5 physical tests to present them to the experts and specialists. These tests are:

Table 3. Selected Fundamental Skills and Physical Attributes Along with Their Corresponding Tests

No.	Skills and Physical Attributes	Tests
1	Dribbling	Dribbling the ball around five cones using the Barrow method.
2	Passing	Passing a ground ball from a dribbling onto a divided platform.
3	Trapping	Trapping the dribbling ball within a circle.
4	Shooting	Shooting with the foot from stationary balls across five sections.
5	Sprint Speed	20-meter sprint from a standing start.
6	Flexibility	Bent trunk forward from a standing position
7	Explosive Strength of the Legs	Standing broad jump.
8	Speed Endurance	80-meter sprint from a standing start.
9	Agility	Zigzag sprint using the Barrow method.

Psychometric Properties of the Specified Physical and Skill Tests

The researcher must present the tests to specialists to establish face validity by obtaining their approval on the accuracy of these tests. Specialists are asked to provide their opinions on the tests, relying on logical thinking, also known as critical thinking, and personal experience (Radwan, 2006). The researcher accomplished this by presenting the tests to specialists and making minor adjustments based on their feedback. The researchers presented the previous physical and skill tests to the experts and specialists, obtaining their approval before applying them to the current study sample. The researchers relied on a 75% approval rate from experts' and specialists' opinions to adopt each test. As a result of this process, all physical and skill tests received approval rates ranging from (80%) to (100%). This confirms that the researchers have established the face validity of the tests.

The researchers determined reliability through the test-retest method, which involves administering the same test twice in the same format (Milhem, 2005). The tests were administered to (20) players representing the reliability sample. Then, the physical and skill tests were reapplied to the same individuals after a set period. The reliability coefficient was calculated by determining Pearson's simple correlation coefficient between the scores of the first and second administrations. Table (4) shows the reliability coefficients for the physical and skill tests.

Table 4. Reliability Coefficients for the Skill and Physical Tests

No.	Tests	Reliability Coefficients	Sig.
1	Dribbling the ball around five cones using the Barrow method.	0،832	0.001
2	Passing a ground ball from a dribbling onto a divided platform.	0،843	0.001
3	Trapping the dribbling ball within a circle.	0،829	0.001
4	Shooting with foot from stationary balls across five sections.	0،870	0.001
5	20-meters sprint from a standing start.	0،887	0.001
6	Bent trunk forward from a standing position	0،862	0.001
7	Standing broad jump.	0،804	0.001
8	80-meter sprint from a standing start.	0،797	0.001
9	Zigzag sprint using the Barrow method.	0،847	0.001

*Significant at a significance level of (0.05).

After establishing the face validity of the specified physical and skill tests, the researchers conducted an initial pilot administration with a reliability sample of (10) young players from the research population. This aimed to assess the players' ability to perform the tests, evaluate the feasibility of measurement by the researcher, and train the team on test application and result recording. This pilot experiment resulted in the following:

1. The test is suitable for the players' skill level.
2. Players' ability to perform the tests effectively.

3. Specification of test locations and score divisions.
4. Training the team on test administration and recording results.

After the researchers completed the physical and skill tests in their final form and obtained the psychometric properties for these tests. They applied the tests to the main sample of the research, which consisted of (96) players from (February 18, 2024, to March 28, 2024). The following points were considered during the application of the tests: 1) Application of the Tests: The tests are conducted after the players have completed adequate warm-up exercises during training sessions under the coach's supervision; 2) Rest Periods Between Tests: Rest periods are provide between tests to ensure the player returns to their normal state before starting the next test. The researchers used various methods to calculate study parameters such as arithmetic mean (AM), standard deviation (SD), percentage (%), coefficient of Skewness, mode, multiple regression analysis, and Pearson Correlation Coefficient using the SPSS program.

RESULTS AND DISCUSSION

RESULTS

The results for physical and skill tests used in the research: After the researchers applied the physical and skill tests to the main sample of the study, they extracted the statistical parameters as shown in Table (5).

Table 5. Statistical parameters of physical and skill tests

No	Tests	AM	SD	Mode	Skewness	Results
1	Dribbling the ball around five cones using the Barrow method.	8.03	0.67	8.50	0.70	Natural positive
2	Passing a ground ball from a dribbling onto a divided platform.	19.04	3.16	19	0.012	Natural positive
3	Trapping the dribbling ball within a circle.	14.40	1.62	15	-0.37	Natural negative
4	Shooting with foot from stationary balls across five sections.	24.88	4.56	22	0.63	Natural positive
5	20-meters sprint from a standing start.	3.67	0.27	3.50	-0.62	Natural negative
6	Bent trunk forward from a standing position	5.80	4.11	7	-0.29	Natural negative
7	Standing broad jump.	1.91	0.18	2	-0.5	Natural negative
8	80-meter sprint from a standing start.	10.42	1.47	9.90	-0.35	Natural negative
9	Zigzag sprint using the Barrow method.	5.50	0.30	5.75	0.83	Natural positive

It is evident from Table (5) that the skewness coefficient for the physical and skill tests falls within the range of (±1), indicating the suitability of the tests for the sample level and the potential to generalize the results in the future to similar samples. "The skewness coefficient is considered acceptable and highly logical if it ranges between (±1)" (Al-Tikriti & Al-Obeidi, 1999). Subsequently, the researchers aimed to achieve the study's objectives by deriving predictive equations for the skill tests based on the physical tests. The results of the contribution ratios of physical tests to the dribbling test around five cones using the Barrow method: The researchers extracted the contribution ratios of physical tests to the performance of the dribbling test around five cones using the Barrow method, as shown in Table (6).

Table 6. Contribution ratios of physical tests to the dribbling test around five cones using the Barrow method

Method	Physical variables	Stable No.	Coefficient	calculated F	Sig.	Pearson Correlation Coefficient	Determination Coefficient
Multiple regression	20-meter sprint from a standing start.	4.380	0.586	7.884	0.001	0.554	0.307
	Bent trunk forward from a standing position		-0.044				
	Standing broad jump.		0.232				
	80-meter sprint from a standing start.		-0.155				
	Zigzag sprint using the Barrow method.		0.559				

***** Significant at a significance level of (0.05).

It is evident from Table (6) that when using the method of multiple regressions by including all physical variables with the dribbling test around (5) cones using the Barrow method, the contribution ratio reached (30.7%). While the calculated F value was (7.884) with a significance level of (0.001), which is statistically significant. This allows us to derive the following predictive equation for the dribbling skill based on the physical variables: Dribbling Skill = 4.380 + 0.586 (20m Sprint from a Standing Position) +(-0.044) (Bent Trunk Forward from a Standing Position) + 0.232 (Broad Jump from a Standing Position) +(- 0.155) (80m Sprint from a Standing Position) + 0.559 (Zigzag sprint using the Barrow Method). The results of the contribution ratios of physical tests to the ground passing ball test from dribbling onto a Divided Platform: The researchers extracted the contribution ratios of physical tests to the performance of the ground pass from the dribbling on a divided platform, as shown in Table (7).

Table 7. Contribution ratios of physical tests to the ground pass test from dribbling on a Divided Platform

Method	Physical variables	Physical variable	Stable No.	calculated F	Sig.	Pearson Correlation Coefficient	Determination Coefficient
Multiple regressions	20-meter sprint from a standing start.	17.995	-0.435	2.461	0.039	0.349	0.121
	Bent trunk forward from a standing position		-0.071				
	Standing broad jump.		3.237				
	80-meter sprint from a standing start.		-0.588				
	Zigzag sprint using the Barrow method.		0.650				

It can be seen from Table (7) that when using the method of multiple regressions by including all physical variables with the test of passing a ground ball from dribbling on a divided platform, the contribution ratio value reached (12.1%). While the calculated F value was (2.461) with a significance of (0.039), which is a significant value. This allows us to derive the following predictive equation for the passing skill based on the physical variables: 1) Passing Skill = 17.995 +(- 0.435) (20m sprint from standing) +(-0.071 Bent Trunk Forward from a Standing Position) + 3.237 (broad jump from standing) +(- 0.588) (80m sprint from standing) + 0.650 (zigzag sprint in the Barrow method). The results of the contribution ratios of physical tests to the trapping test of the dribbling ball within a circle: The researchers extracted the contribution ratios of the

physical tests to the performance of the test of trapping the dribbling ball within a circle, as shown in Table (8).

Table 8. Contribution ratios of physical tests to the trapping test of the dribbling ball within a circle

Method	Physical variables	Physical variable	Stable No.	calculated F	Sig.	Pearson Correlation Coefficient	Determination Coefficient
Multiple regressions	20-meter sprint from a standing start.	21.072	-1.190	0.963	0.445	0.226	0.051
	Bent trunk forward from a standing position		-0.010				
	Standing broad jump.		-0.031				
	80-meter sprint from a standing start.		-0.004				
	Zigzag sprint using the Barrow method.		-0.388				

It is evident from Table (8) that, when using the multiple regressions method by incorporating all physical variables with the Trapping of the Dribbling Ball within a Circle test, the contribution ratio was (5.1%), with a calculated F-value of (0.963) and a significance level of (0.445), which is non-significant. Therefore, the researchers refrained from deriving a prediction equation. The results of the contribution ratios of physical tests to the shooting with the foot from stationary Balls test: The researchers extracted the contribution ratios of the physical tests to the performance of the shooting with the foot from the stationary balls test, as shown in Table (9).

Table 9. Contribution ratios of physical tests to the shooting with foot from stationary balls test

Method	Physical variables	Physical variable	Stable No.	calculated F	Sig.	Pearson Correlation Coefficient	Determination Coefficient
Multiple regressions	20-meter sprint from a standing start.	26.175	-3.264	2.406	0.043	0.345	0.119
	Bent trunk forward from a standing position		-0.113				
	Standing broad jump.		6.016				
	80-meter sprint from a standing start.		0.051				
	Zigzag sprint using the Barrow method.		-0.131				

It is evident from Table (9) that when using the method of multiple regressions by entering all physical variables with the shooting test from stationary balls, the contribution ratio was (11.9%). While the calculated F value was (2.406) with a significance level of (0.043), which is a significant value. This allows us to derive the following prediction equation for the shooting skill based on the physical variables: 1) Shooting Skill = 26.175 +(- 3.264) (Running 20m from a Standing Position) +(- 0.113) (Bent Trunk Forward from a Standing Position) + 6.016 (Broad Jump from a Standing Position) + 0.051 (Running 80m from a Standing Position) +(- 0.131) (zigzag sprint in the Barrow method).

DISCUSSION

The physical tests used in the research contributed significantly to the results of the dribbling skill test, which underscores the importance of physical tests in assessing the dribbling skills of young football players in the academies of Mosul City. These results are consistent with the study's findings (Hardinata et al., 2023; Herdianto et al., 2021) that education and training positively improve dribbling skills.

There is a contribution ratio of the physical tests used in the research to the results of the passing skill test, which emphasizes the importance of the physical tests used in the performance of the passing skill for young football players in the academies of Mosul City. The physical tests used in the research contributed significantly to the shooting skill test results, confirming their importance in assessing shooting skills among young football players in the Mosul City academies. The study results by (Raaiyatini et al., 2024) confirm that the education and training applied to learners enhance their athletic performance. However, the results show that there is no contribution ratio of the physical tests used in the research to the results of the trapping skill test, indicating that the physical tests used in the performance of the trapping skill are not crucial for young football players in the academies of Mosul City.

Continuous training improves players' athletic performance and enhances their self-confidence, which contributes positively to raising their level of performance. Some studies conducted on different categories and trainings showed the positive role of these trainings or practices on their athletic performance (Kuswoyo, et al., 2023; Prakarsa, 2020).

In addition, the researcher prediction the equations for fundamental skills were developed based on physical tests for young football academy players, as follows:

1. Bent Trunk Forward from a Standing Position + 3.237 Standing Broad Jump + (-0.588) sprint (80m) from Standing + 0.650 Zigzag sprint (Barrow method).
2. Shooting Skill = 26.175 + (-3.264) Sprint (20m) from Standing + (-0.113) Bent Trunk Forward from Standing Position + 6.016 Standing Broad Jump + 0.051 Sprint (80m) from Standing + (-0.131) Zigzag Sprint (Barrow method).
3. Dribbling Skill = 4.380 + 0.586 Sprint (20m) from Standing + (-0.044) Bent Trunk Forward from Standing Position + 0.232 Standing Broad Jump + (-0.155) Sprint (80m) from Standing + 0.559 Zigzag Sprint (Barrow method).
4. Passing Skill = 17.995 + (-0.435) sprint (20m) from Standing + 0.07

CONCLUSION

The researchers concluded that the physical tests directly impact the results of the dribbling skill test among young players in the Mosul City academies. They also directly impact the passing and shooting skill test results among young players in the Mosul City academies. However, the physical tests do not impact the results of the trapping skill test among young players in the Mosul City academies. The researchers recommend that physical tests be conducted for players that contribute to improving the performance of student-athletes.

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