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Design and standardization of a test to measure agility and speed in under-19 football players of the Iraqi Premier League clubs

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ABSTRACT

The aim of this study was to design and standardize a test to measure agility and speed in under-19 football players of the Iraqi Premier League clubs for the 2021/2022 season. Furthermore, the study aimed to establish benchmark scores and performance levels for the rolling agility test among footballers in Iraqi Premier League clubs for the specified season and age group. The researcher adopted the descriptive approach. The research community was selected in a deliberate way, which included 218 players from the Iraqi Premier League clubs under the age of 19 in football for the 2021/2022 sports season, representing 9 clubs in Baghdad. The final sample size consisted of 204 players, representing 93.58% of the original population. The research test has demonstrated its validity in measuring the speed of rolling agility performance. It was distributed moderately among the sample, indicating its capability to discern between high-level and low-level achievement among the participants. Additionally, the test has shown high reliability, stability, and objectivity coefficients, further validating its effectiveness as a measurement tool. The adoption of the test, identified as a variable for evaluating the training status of football players under the age of 19, by coaches is crucial. Coaches should adhere to the criteria established by research during the evaluation and selection process.

KEYWORDS

Agility; Training Condition; Football

1. INTRODUCTION

There are supporting sciences that have helped football progress, and perhaps one of the most prominent among these is the role of testing and measurement science as a tool for evaluation in the sports field. This science serves as a foundation for the science of sports training, playing an

important and essential role in evaluating performance levels. It reveals performance in training units and matches, and contributes to the development plan with scientific objectivity and accuracy. Specialists, experts, and researchers actively contribute to developing tests for all aspects, including physical, skill-based, tactical, psychological, and educational evaluations of players, which are monitored periodically (Cherappurath et al, 2023).

This statement, attributed to Hassanein (1995), while some tests and measures may not be commonly utilized, they are often the most effective ones available. However, these tests may be time-consuming or require significant effort to conduct, or they may lack specificity in measuring certain elements. Additionally, some tests may have been developed solely to measure average performance. Therefore, it is essential to reconsider the test groups used and to create new groups that reflect the demands of motor performance closely or simulate real playing requirements. Such tests should accurately reflect the player's training status, assisting football coaches in assessing the player's level, whether in terms of physical attributes or skills.

Researchers, academics, and coaches continue to address the obstacles hindering the advancement of Iraqi football through research and study. The researcher, drawing on experience as a current player, coach, and academic familiar with numerous studies on tests and measurements in football, has observed that few studies accurately gauge the true level of the player. Some studies focus solely on measuring performance form or speed without adequately considering skill performance. Others lack tests that sufficiently challenge players, failing to accurately represent their abilities in training or matches, be it in terms of physical prowess or skill.

The aims of this study are to design and legalize a rolling agility performance speed test tailored for football players in Iraqi Premier League clubs for the 2021/2022 season, focusing on athletes under the age of 19. Furthermore, the study seeks to establish benchmark scores and performance levels for the rolling agility test among footballers in Iraqi Premier League clubs for the specified season and age group.

2. METHODS

2.1. Study design and participants

The nature of the problem and the objectives of the research are the ones that determine the appropriate research methodology, so the researcher adopted the descriptive approach in the survey method in order to suit the nature of the problem and the objectives of the research.

The research community was selected in a deliberate way, which included 218 players from the Iraqi Premier League clubs under the age of 19 in football for the 2021/2022 sports season,

representing 9 clubs in Baghdad, and they are the entire community of origin. The study was conducted from October 1, 2021, to May 1, 2022. A total of 24 players were excluded from the study due to incomplete tests resulting from injury, absence from training units, or being excluded by the coach. As a result, the actual sample size consisted of 204 players, representing 93.58% of the original population. The researcher considered the distribution of club teams for constructing the sample, as well as for rationing and conducting exploratory experiments, as detailed in Table 1.

Table 1. Sample distribution and locations under study

S	Club name	No.	Sample Exploratory Experiments	Construction Sample	Sample Legalization	Excluded Players
1	Al-Zawraa Club	**25**		**22**		**3**
2	Air Force Club	**26**		**23**		**3**
3	Police Club	**25**		**22**		**3**
4	Students Club	**25**		**23**		**2**
5	Oil Club	**22**		**18**		**4**
6	Industry Club	**26**			**23**	**3**
7	Electricity Club	**25**			**23**	**2**
8	Baghdad Municipality club	**26**			**24**	**2**
9	Karkh Club	**22**	**20**			**2**
	Total	218	20	108	70	24
	Percentage %	100%	9.17%	49.54%	32.11%	11%

2.2. Procedures

After reviewing numerous sources and scientific research, as well as drawing on the researcher's extensive experience in their specialized field as both a player and coach, consultations were conducted with experts in the realm of sports training, testing, measurement, and football coaching. The objective was to develop a test that effectively measures rolling performance agility, given the absence of such a measure in this area. The researcher then designed an agility performance test tailored to the specific demands of the game, aimed at achieving the objectives outlined in the current study and simulating competitive requirements. It's important to note that this test, which was designed by the researcher, incorporated input from a panel of experts and specialists in testing, measurement, and football.

The researcher considered the following points regarding the research sample for the test: The test should be clear, understandable, and suitable for football players. The test should not be time-

consuming and should not require excessive effort or potential. The test should incorporate elements of suspense and competition.

In order to confirm the integrity of the procedures and the way in which the data is obtained, exploratory experiments were conducted, whose purpose and objective differed between each one and the other.

The first exploratory experiment took place on Monday, November 22, 2021, at three o'clock in the afternoon. The test was administered to 20 players from Al-Karkh Club, with assistance from the work team. The objectives were to: 1) Ensure the accuracy and safety of the devices and tools used. 2) Assess the suitability of the test for the study sample and identify any difficulties faced by the participants, the researcher, and the assistant team during the application. 3) Determine the time required to complete the test.

Adjustments were made to some aspects of the test based on the results of the exploratory experiment to better suit the study sample and align with the specific requirements of the game. These adjustments included reducing the distance between signs from 1.5 meters to 1 meter and modifying the rotation around the sign to align with clockwise rotation.

The researcher extracted the sincerity of the test as he used the sincerity of the content or content through the questionnaire form that was distributed to experts and specialists to poll their opinions on the validity of the test, as we can consider the test honest if it is presented to a number of specialists or experts in the field and they judge that it measures what was developed to measure it adequately (Al-Zyoud & Nader, 1998).

In addition, the researcher resorted to discriminatory honesty as he arranged the raw scores obtained by the members of the survey sample in descending order, from the highest degree to the lowest degree, and the 50% of the upper scores of 10 players. The same from the lower grades. The percentage of 50% of the upper and lower grades represents the best ratio and, accordingly, the T test was used for equal samples (independent), and after processing the data statistically, it was found that the value of T calculated was significantly greater than tabular values from the significance level (1.73) at the degree of freedom 18, as shown in Table 2.

Table 2. Discriminatory Honesty for Physical Tests - Skill

Test Name	Unit of measurement	Lower		Upper		Value (T)
		s	e	s	e	
Running between the signs with the ball	Second	41.37	2.74	38.28	1.59	5.29

Note: Tabular score (1.73) with significance level 0.05 and degree of freedom n-2 = 18

The researcher conducted the test on 1/12/2021, and after seven days passed, the test was repeated on 8/12/2021. Then, the results of the two tests were treated statistically using Pearson's correlation law. The results indicated that all correlation coefficients (stability coefficient) were good, as shown in Table 3.

The researcher extracted the objectivity of the test by recording the results of the scores of two referees, and processing the results statistically using the simple correlation coefficient (Pearson) between the scores of the first judgment and the second judgment. It turned out that the calculated values were all greater than the tabular value, as shown in Table 3.

Table 3. The coefficient of stability and objectivity of the test

Tests	Stability	Objectivity
Running between the signs with the ball	0.87	0.92

The main experiment was conducted on the construction sample, which consisted of 108 players. The period taken on the construction sample was from 12/20/2021 to 1/25/2022, and all the data obtained by the researcher was collected through conducting tests and then processed statistically, as well as the researcher conducted tests on the standards sample for the period from 1/30/2022 to 3/12/2022 on a sample of 70 players.

After conducting the main experiment, the data was arranged in raw scores for each test in ascending order from the lowest degree to the highest degree, then selected from them 27% of the upper grades as well as 27% of the lower grades, where the number of the upper group (29) and the number of the lower group (29) identified the ability of the test to distinguish between the group with outstanding performance and non-outstanding performance. Accordingly, T tests were used, and after processing the data statistically, it was found that all the calculated values were greater than the tabular value of T of 1.67 at the degree of freedom 56 with a significance level of 0.05, which indicates the existence of significant differences. This is shown in Table 4.

Table 4. Discriminatory ability of the test

Test Name	Unit of measurement	Lower		Upper		Value (T)
		s	e	s	e	
Running between the signs with the ball	Second	40.15	2.55	37.75	1.96	8.15

Tabular score (1.67) with significance level 0.05 and degree of freedom n-2 = 56

When the test is suitable for the research sample, it means that the sample will be distributed naturally, so the law of torsion coefficient was used to verify that the results of the sample members were moderately distributed according to the test as an indicator to indicate this (Table 5).

Table 5. The arithmetic media, standard deviations, median and torsion coefficient on the construction sample

Test Name	Mean	Median	Standard Deviation	Torsion Coefficient
Running between the signs with the ball	38.78	39.96	2.17	1.63 -

Final test and performance description: Running between posts with the ball. Test objective: To measure the speed of rolling agility. Tools: 20 cm long shaft, football, stopwatch. The player starts rolling the ball from the starting point of the central circle in the middle of the field towards spears number 1, 2, 3, and 4, each located 1 meter away from the starting point. The player then executes a zigzag run between them, with each spear spaced 1 meter apart. Next, the player runs to spear number 5, rotates clockwise, and proceeds to Spears No. (6, 7, 8, and 9), running zigzag between them. After reaching spear 10, the player rotates clockwise again and returns to the center. Then, the player runs to spears 11, 12, 13, and 14, zigzagging between them, before reaching spear 15. After rotating clockwise once more and circling it, the player proceeds to spears 16, 17, 18, and 19, zigzagging between them, and finally runs to spear number 20. Then rotating clockwise again and heading back to the center, as shown in Figure 1. Recording: The time taken for the player to cover the distance is recorded, starting from the moment of the start signal until the end of the distance.

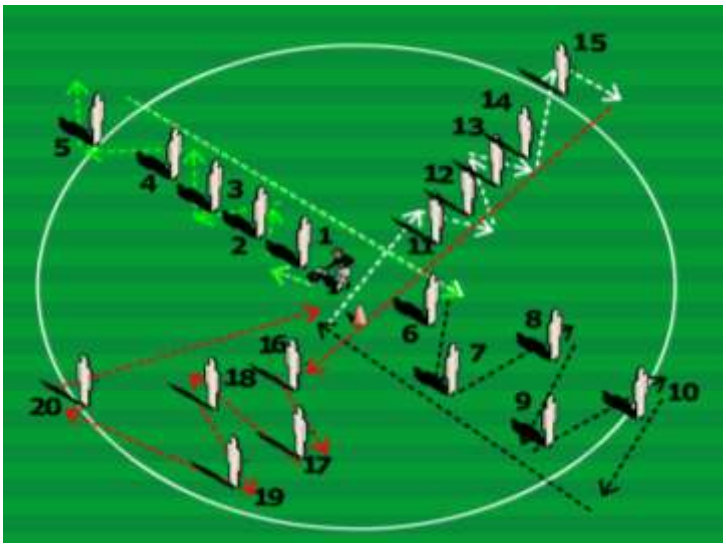

Figure 1. Rolling Agility Performance Speed Test

3. RESULTS AND DISCUSSION

The researcher extracted the arithmetic mean, standard deviation, median and torsion coefficient to identify how the test is distributed when applied to the rationing sample (Table 6).

Table 6. Descriptive statistics results of the distribution of the test on the sample

Test	Mean	Median	Standard Deviation	Torsion Coefficient
Running between the signs with the ball	38.41	39.29	2.22	0.16

After conducting the steps for the application of the test on the sample members, raw grades were obtained. However, achieving the research objectives, which involve finding standard scores for players under the age of 19, poses a challenge. Obtaining raw grades is easy for measurement, but the difficulty lies in interpreting these scores and assigning them meaning and significance, as the means of measurement vary from one test to another. To establish standards, raw scores must be converted into standard scores, which provide a way to determine the relative standing of raw scores. These scores can then be interpreted and their results evaluated (Allawi & Radwan, 1979). These standard scores typically range from 100 to zero, representing the highest to the lowest scores. Utilizing this approach may help achieve the goal of the second research phase, as illustrated in Table 7.

Table 7. The raw and standard scores adjusted by the sequential method of the test

Raw grade	Standard grade	Raw grade	Standard grade	Raw grade	Standard grade	Raw grade	Standard grade
43.91	25	38.41	50	32.91	75	27.41	100
44.13	24	38.63	49	33.13	74	27.63	99
44.35	23	38.85	48	33.35	73	27.85	98
44.57	22	39.07	47	33.57	72	28.07	97
44.79	21	39.29	46	33.79	71	28.29	96
45.01	20	39.51	45	34.01	70	28.51	95
45.23	19	39.73	44	34.23	69	28.73	94
45.45	18	39.95	43	34.45	68	28.95	93
45.67	17	40.17	42	34.67	67	29.17	92
45.89	16	40.39	41	34.89	66	29.39	91
46.11	15	40.61	40	35.11	65	29.61	90
46.33	14	40.83	39	35.33	64	29.83	89
46.55	13	41.05	38	35.55	63	30.05	88
46.77	12	41.27	37	35.77	62	30.27	87
46.99	11	41.49	36	35.99	61	30.49	86
47.21	10	41.71	35	36.21	60	30.71	85
47.43	9	41.93	34	36.43	59	30.93	84
47.65	8	42.15	33	36.65	58	31.15	83
47.87	7	42.37	32	36.87	57	31.37	82
48.09	6	42.59	31	37.09	56	31.59	81

48.31	5	42.81	30	37.31	55	31.81	80
48.53	4	43.03	29	37.53	54	32.03	79
48.75	3	43.25	28	37.75	53	32.25	78
48.97	2	43.49	27	37.97	52	32.47	77
49.19	1	43.69	26	38.19	51	32.69	76

It is evident from Table 8 that the majority of the sample falls between the acceptable and average categories. This suggests that the sample lacks the necessary speed required for skill performance, particularly at their age, where players should possess both speed and body control. The researcher emphasizes the importance of agility in this sport, as it enables players to execute football movements with precision while effortlessly changing direction and speed. Agility is defined as "the ability of the player to execute football movements with utmost perfection, incorporating changes in direction and speed seamlessly" (Qatqh, 1990). This is evident in motor performance tasks such as dribbling, running in a zigzag pattern, stopping abruptly, and then swiftly changing direction. Agility is also crucial in movements involving dribbling, deception, scoring goals, or handling the ball. Hamid & Hassanein (1979) emphasized the interconnectedness of agility with all aspects of physical performance, highlighting its close relationship with motor ability.

Table 8. Limits of standard levels of the results of the research sample in the test of running between the signs with the ball

Levels	**Categories**	**Repetitions**	**Percentage %**
Very good	31.04 or below	4	6.98
Good	31.05 – 34.67	7	11.63
Average	34.68 – 38.30	16	23.26
Acceptable	38.31 – 41.93	22	29.06
Weak	41.94 – 45.56	12	16.28
Very weak	45.57 – 49.19	9	12.79
Total		**70**	100

Here, the significance of compound exercises becomes apparent when connecting agility with fundamental rolling skills. This highlights a clear deficiency in the execution of these skills, emphasizing the necessity for coaches to prioritize purposeful compound exercises during the special preparation period. The enhancement of basic skills relies on the development of physical abilities,

particularly agility. In football, where the integration of abilities with skills is crucial, if a specific skill necessitates the presence of a physical variable affecting its execution, agility becomes paramount. The element of agility relies not only on the individual's prior abilities but also on the actual processes predominantly associated with the physical and motor qualities of the individual, which encompass "physical and motor readiness to transfer diverse and complex motor tasks or the ability to absorb motor learning quickly with proficient motor skills capable of executing such tasks" (Mahjoub, 1989).

This assertion is corroborated by contemporary training science, which indicates that incorporating exercises that closely resemble match conditions or simulate game requirements leads to the simultaneous development of both physical and technical skills. This is due to the specificity of these exercises, as they place the player in scenarios akin to match conditions, thereby bolstering the player's self-confidence and readiness to compete in official matches while attaining optimal performance levels.

4. CONCLUSIONS

The research test has demonstrated its validity in measuring the speed of rolling agility performance. It was distributed moderately among the sample, indicating its capability to discern between high-level and low-level achievement among the participants. Additionally, the test has shown high reliability, stability, and objectivity coefficients, further validating its effectiveness as a measurement tool.

The adoption of the test identified as a variable for evaluating the training status of football players under the age of 19 by coaches is crucial. Coaches should adhere to the criteria established by research during the evaluation and selection process. Additionally, continuous updating and adjusting of standards based on the capabilities of the players and evolving trends over the years are essential.

Football coaching curricula should become more specialized in enhancing the training environment and integrating physical and skill abilities to meet the demands of competition. This entails designing tests for various physical abilities and skills, and codifying them to yield results that contribute to the advancement of the game.

Coaches should take a keen interest in the findings of this study and actively work towards enhancing and refining the physical and skill abilities of aspiring football players, aiming to cultivate talents akin to those observed in first-class football players.

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All authors listed have made a substantial, direct and intellectual contribution to the work, and approved it for publication.

CONFLICTS OF INTEREST

The authors declare no conflict of interest.

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