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Determining standard scores for some physical characteristics of football players

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Abstract:
The study aims to identify the level of physical performance among football players, as well as to determine standard scores for the physical characteristics under study. In this study, the researchers used the descriptive approach as it was appropriate to the nature of the study. The study sample consisted of 40 football players under 19 years of age For the purpose of collecting information, the researchers used a set of physical tests to measure the level of physical performance, and in order to treat the data statistically, the arithmetic mean, standard deviation, hypothetical mean, and quartiles were used, and finally a set of results were reached.
Keywords: Standard scores; physical attributes; football players.

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1. INTRODUCTION

Football is a sport that requires an integration of physical, technical, tactical, and psychological components. Contemporary athletic performance increasingly relies on scientific preparation based on principles of measurement and sports evaluation. The physical aspect is considered one of the most important determinants of achievement in football, due to the high demands of modern competition, which include speed, strength, endurance, agility, and the ability to adapt to various game situations (Mustafa, Majed & Osama, 2020).

Recent trends in football training show that the development of physical qualities not only improves performance but also enhances players' functional efficiency, reduces injuries, and improves their ability to respond to the demands of high-intensity matches (Tahri & Aboura, 2020).

From this perspective, sports measurement has become an essential scientific tool for assessing players' levels, as it allows the identification of individual differences and the determination of strengths and weaknesses. It also enables the monitoring of progress resulting from training programs. Standard scores are among the most widely used statistical methods in this field, as they provide an objective basis for converting raw results into interpretable indicators that can be compared across players and sports groups (Al-Fartousi & Al-Husseini, 2020).

Accordingly, determining standard scores for certain physical attributes among football players represents an important scientific step that helps researchers and coaches build normative databases, guide the talent-selection process, and standardize training programs based on objective indicators that contribute to improving athletic performance.

1. Research Questions:

1-1- What is the level of physical performance among football players in the physical tests under study?

1-2- What normative levels can be established for a set of physical tests specific to football players?

2. Research Hypotheses:

2-1- The level of physical performance among football players in the physical tests under study falls within an average rating.

2-2- The normative levels established for the physical tests specific to football players are distributed across four levels.

3. Research Objectives:

- To identify the level of physical performance among football players.
- To determine the standard scores for selected physical attributes among football players.

4. Definitions of Terms:

4-1- Standard Scores:

Standards are one of the primary objectives of test standardization. They are derived from the standardization sample, which represents the original population under study. The value of using standards appears particularly in test batteries, where measurement units differ—some tests use meters, others seconds, or repetitions. Therefore, researchers seek to convert raw scores into standard scores.

4-2- Physical Attributes:

Scholars differ in naming the components of physical fitness; some refer to them as attributes, components, or elements of physical fitness. Physical attributes are widely used terms in sports training (Sanousi, 2014).

4-3- Football:

Football is, first and foremost, a team sport played by two teams, each consisting of 11 players, including the goalkeeper. The match is officiated by four referees: one on the field of play, two assistant referees along the touchlines, and a fourth (reserve) official. (Faisal Rashid Ayash Al-Dulaimi & Omar Abdul-Haq, 1997).

5. Previous Studies:

5-1- Study by Al-Haimas (2022):
The researcher conducted a study titled *"Standard Scores and Normative Levels for Evaluating Selected Basic Offensive Skills in Volleyball among Students of the College of Physical Education and Sports Sciences, University of Al-Qadisiyah"* (2022). The study aimed to establish standard scores and normative levels for evaluating certain basic offensive skills in volleyball. The descriptive method was used, and the sample consisted of 95 students. The researcher concluded that the selected tests were appropriate for the sample's level and that most participants fell within the average normative level in several offensive skills.

5-2- Study by Hussein (2023):
The researcher conducted a study titled *"Determining Standard Scores for Key Anthropometric Measurements for Selecting Female Handball Players in the Education Directorate Team"* (2023). The study focused on identifying the most important body measurements to be used in the selection process. The descriptive survey method was used, and the sample consisted of 100 female students. The researcher concluded that the most important anthropometric measurements for selecting players were weight, total height, arm length, hand length, and hand width.

6. Research Method:
The researchers used the descriptive method due to its suitability for the nature of the study.

7. Research Sample:
The study sample consisted of 40 male football players under 19 years old.

8. Research Tools:
The tools used in the study were the following physical tests:

- Sit-and-reach test.

- VAMEVAL test.
- Illinois agility test.
- 30-meter sprint from standing start.
- Standing long jump.
- 2-kg medicine ball throw.

9. Statistical Methods:

Data were processed statistically using SPSS version 23.

10. Presentation and Discussion of Results:

10-1- Presentation and Discussion of the First Hypothesis:

Table (01) represents the level of physical performance among football players under 19 years old.

If you want, I can also translate the remaining tables, results, or the conclusion, or help you rewrite the entire text in a more academic English style.

Statistical Methods	Arithmetic mean	Standard deviation	Standards				Level of sample members
			weak	average	good	excellent	
Long-sitting forward trunk flexion test	37.40	2.09	Less than 36	Between 36 and 37	Between 37.01 and 38	More than 38	good
Vamevale Test	15.05	1.54	Less than 14	Between 14 and 15.30	Between 15.31 and 16.2	More than 16.2	average
Illinois Test	19.78	1.07	Less than 20.52	Between 19.7 and 20.52	Between 18.92 and 19.69	Less than 18.92	average
30-meter run test	4.49	0.25	Less than 4.72	Between 4.49 and 4.72	Between 4.31 and 4.48	Less than 4.31	average
Standing Long Jump Test	2.24	0.16	Less than 2.10	Between 2.10 and 2.20	Between 2.21 and 2.30	More than 2.30	good
2- kg			Less	Between	Between	More	

medicine ball throw test	8.15	1.48	than 7.34	7.34 and 7.80	7.81 and 9.50	than 9.50	good

It is evident from Table (01), which represents the physical performance level of football players under 19 years old, that the physical performance of the study sample ranged between *average* and *good*. When comparing the mean scores of the following tests—VAMEVAL test, Illinois agility test, and 30-meter sprint—with the established standards, it becomes clear that the players' performance in these tests falls within the *average* level.

In contrast, when comparing the mean scores of the following tests—sit-and-reach test, standing long jump, and 2-kg medicine ball throw—with the standards, it appears that the players' performance in these tests falls within the *good* level.

The researchers attribute the variation in performance levels—ranging from average to good—to the fact that each player possesses different physical characteristics, which may be due to differences in playing positions or training age. These factors naturally lead to slight variations in performance levels. For example, wingers and wide players tend to be faster than central defenders or players in other positions. Therefore, coaches—especially strength and conditioning coaches—must pay attention to all physical components while also considering the specific demands of each playing position.

These results can be interpreted by noting that physical performance in football depends on an integrated set of physical attributes whose development varies according to the type of training programs applied. Physical preparation forms the fundamental base upon which athletic performance is built, as it contributes to developing players' functional and physical capacities to meet the demands of competition (Allawi, 2002, p. 87).

The players' average performance in endurance, speed, and agility tests may be attributed to the fact that these qualities require regular training programs based on progressive load, continuity, and scientifically regulated training doses—especially since these physical components are directly linked to the nature of modern football training (Issam, 2005, p. 112).

On the other hand, achieving a good level in flexibility and muscular strength tests can be explained by the positive influence of continuous football-specific training activities, which rely heavily on movement exercises, functional training, and

repeated muscular work. These activities contribute to improving muscular strength and joint range of motion among players (Hammad, 2010, p. 146).
These findings are consistent with previous studies that have confirmed the presence of variation in physical fitness levels among youth football players, as the development of each physical attribute differs depending on the type of training applied, training age, and competition level.

Accordingly, it can be concluded that the physical performance of football players under 19 years old is characterized by noticeable variation across different physical components. This highlights the need to place greater emphasis on developing endurance, speed, and agility in future training programs.

10-2- Presentation and Discussion of the Results of the Second Hypothesis:

Table (02) presents the standard scores for the sit-and-reach test (forward trunk flexion from long sitting).

Test Name	Standard scores	Level	Repetition	Percentage
Long-sitting forward trunk flexion test	Less than 36	weak	4	13.33 %
	Between 36 and 37	average	12	40 %
	Between 37.01 and 38	good	8	26.66 %
	More than 38	excellent	6	20 %

From Table (02), which presents the standard scores for the sit-and-reach test (forward trunk flexion from long sitting), it is evident that using quartile distribution allowed the classification of performance into four levels.
The first level, **"Weak,"** corresponds to scores **below 36 cm**, and this level included **4 players**, representing **13.33%** of the sample. The second level, **"Average,"** corresponds to scores **between 36 and 37 cm**, and included **12 players**, representing **40%** of the sample. The third level, **"Good,"** corresponds to scores **between 37.01 and 38 cm**, and included **8 players**, representing **26.66%** of the sample. The fourth level, **"Excellent,"** corresponds to scores **above 38 cm**, and included **6 players**, representing **20%** of the sample.

Table (03) presents the standard scores for the VAMEVAL test:

Test Name	Standard scores	Level	Repetition	Percentage
Vamevale Test	Less than 14	weak	8	26.66 %
	Between 14 and 15.30	average	8	26.66 %
	Between 15.31 and 16.20	good	7	23.33 %
	More than 16.20	excellent	7	23.33 %

From Table (03), which presents the standard scores for the VAMEVAL test, it is clear that using quartiles as a statistical method allowed the classification of performance into four levels.

The first level, **"Weak,"** corresponds to scores **below 14 km/h**, and this level included **8 players**, representing **26.66%** of the sample. The second level, **"Average,"** corresponds to scores **between 14 and 15.30 km/h**, and included **8 players**, representing **26.66%** of the sample. The third level, **"Good,"** corresponds to scores **between 15.31 and 16.20 km/h**, and included **7 players**, representing **23.33%** of the sample. The fourth level, **"Excellent,"** corresponds to scores **above 16.20 km/h**, and included **7 players**, representing **23.33%** of the sample.

Table (04) presents the standard scores for the Illinois agility test:

Test Name	Standard scores	Level	Repetition	Percentage
Illinois agility Test	Less than 18.92	excellent	7	23.33 %
	Between 18.92 and 19.69	good	9	30 %
	Between 19.70 and 20.52	average	9	30 %
	More than 20.52	weak	5	16.66 %

From Table (04), which presents the standard scores for the Illinois agility test, it is clear that using quartiles as a statistical method allowed the classification of performance into four levels.

The first level, **"Excellent,"** corresponds to scores **below 18.92 seconds**, and this level included **7 players**, representing **23.33%** of the sample. The second level,

"Good," corresponds to scores **between 18.92 and 19.69 seconds**, and included **9 players**, representing **30%** of the sample. The third level, **"Average,"** corresponds to scores **between 19.70 and 20.52 seconds**, and included **9 players**, representing **30%** of the sample. The fourth level, **"Weak,"** corresponds to scores **above 20.52 seconds**, and included **5 players**, representing **16.66%** of the sample.

Table (05) presents the standard scores for the 30-meter sprint test:

Test Name	Standard scores	Level	Repetition	Percentage
30-meter run test	Less than 4.31	excellent	7	23.33 %
	Between 4.31 and 4.48	good	8	26.66 %
	Between 4.49 and 4.72	average	8	26.66 %
	More than 4.72	weak	7	23.33 %

From Table (05), which presents the standard scores for the 30-meter sprint test, it is clear that using quartiles as a statistical method allowed the classification of performance into four levels.

The first level, **"Excellent,"** corresponds to scores **below 4.31 seconds**, and this level included **7 players**, representing **23.33%** of the sample. The second level, **"Good,"** corresponds to scores **between 4.31 and 4.48 seconds**, and included **8 players**, representing **26.66%** of the sample. The third level, **"Average,"** corresponds to scores **between 4.49 and 4.72 seconds**, and included **8 players**, representing **26.66%** of the sample. The fourth level, **"Weak,"** corresponds to scores **above 4.72 seconds**, and included **7 players**, representing **23.33%** of the sample.

Table (06) presents the standard scores for the standing long jump test:

Test Name	Standard scores	Level	Repetition	Percentage
Standing Long Jump Test	Less than 2.10	weak	14	46.66 %
	Between 2.10 and 2.20	average	4	13.33 %
	Between 2.21 and 2.30	good	2	06.66 %
	More than 2.30	excellent	10	33.33 %

From Table (06), which presents the standard scores for the standing long jump test, it is clear that using quartiles allowed the classification of performance into four levels.

The first level, **"Weak,"** corresponds to scores **below 2.10 m**, and this level included **14 players**, representing **46.66%** of the sample. The second level, **"Average,"** corresponds to scores **between 2.10 and 2.20 m**, and included **4 players**, representing **13.33%** of the sample. The third level, **"Good,"** corresponds to scores **between 2.21 and 2.30 m**, and included **2 players**, representing **6.66%** of the sample. The fourth level, **"Excellent,"** corresponds to scores **above 2.30 m**, and included **10 players**, representing **33.33%** of the sample.

Table (07) presents the standard scores for the 2-kg medicine ball throw test:

Test Name	Standard scores	Level	Repetition	Percentage
2- kg medicine ball throw test	Less than 7.34	weak	7	23.33 %
	Between 7.34 and 7.80	average	9	30 %
	Between 7.81 and 9.50	good	8	26.66 %
	More than 9.50	excellent	6	20 %

From Table (07), which presents the standard scores for the 2-kg medicine ball throw test, it is clear that using quartiles allowed the classification of performance into four levels.

The first level, **"Weak,"** corresponds to scores **below 7.34 m**, and this level included **7 players**, representing **23.33%** of the sample. The second level, **"Average,"** corresponds to scores **between 7.34 and 7.80 m**, and included **9 players**, representing **30%** of the sample. The third level, **"Good,"** corresponds to scores **between 7.81 and 9.50 m**, and included **8 players**, representing **26.66%** of the sample. The fourth level, **"Excellent,"** corresponds to scores **above 9.50 m**, and included **6 players**, representing **20%** of the sample.

11. CONCLUSION

- The performance level of the study sample in the sit-and-reach test (forward trunk flexion) falls within the **good** category.
- The performance level of the study sample in the **VAMEVAL test** falls within the **average** category.
- The performance level of the study sample in the **Illinois agility test** falls within the **average** category.
- The performance level of the study sample in the **30-meter sprint test** falls within the **average** category.
- The performance level of the study sample in the **standing long jump test** falls within the **good** category.
- The performance level of the study sample in the **2-kg medicine ball throw test** falls within the **good** category.

The physical component is one of the most important elements of the training process in both individual and team sports. With the continuous development of sports training science, it has become essential to give greater attention to all physical attributes of football players, while considering the specific needs of each player according to their playing position. This requires the use of modern technological tools to prepare each player appropriately for their role on the field.

Through this study, we aimed to contribute to guiding coaches working with youth football categories—whether during the talent selection process or during general and specific physical preparation—by establishing standard scores that reflect the physical performance levels of the players.

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