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The relative importance of morphological, physical and skill requirements for selecting talented U13 football players

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ABSTRACT

This study aimed to identify the key morphological (anthropometric) measurements, physical characteristics, and skills necessary for selecting young football players in the under-13 age group who have the potential for future excellence. We used a descriptive approach with a survey method, sampling 38 experts in sports training and measurement, focusing on football in the Arab world. A questionnaire with personal information and 37 relevant statements was employed for data collection, analyzed using SPSS. The study results revealed that for morphological requirements, body mass index (BMI) had the highest rating (M = 4.447; SD = 0.601). Among physical requirements, agility scored highest (M = 4.884; SD = 0.619). For skill requirements, ball control had the highest score (M = 4.763; SD = 0.489), followed by dribbling (M = 4.736; SD = 0.554), highlighting their importance for U-13 football players. The study identified several key requirements as highly important for selecting U-13 football players: for morphology, BMI, body fat percentage, body weight, and height; for physical abilities, agility, coordination, explosive power, strength, speed, flexibility, endurance, and motor speed; and for skills, ball control, dribbling, shooting accuracy, ball retention, and passing.

KEYWORDS

Relative Importance; Morphological Requirements; Physical and Skill Requirements; Athletic Talent; U-13

1. INTRODUCTION

The fields of sports competition have advanced significantly, which is evident from the achievements in the Olympic Games, where records once considered dreams have now been set. These achievements reflect a leap in athleticism that pushes the boundaries of the human body's

potential, driven by the scientific progress behind every athletic feat (Abu Al-Ela & Dawoud, 2019). Today, it is clear that world and Olympic champions have achieved remarkable accomplishments in both individual and team sports. These talented individuals possessed the elements of future genius at an early stage in their lives (Kharbit & Othman, 2023).

Scientific studies and research have shown, with unanimous agreement among scientists and specialists, that selecting talented athletes is crucial for a country's sporting excellence. It may be the primary pathway to this superiority, as the athlete champion is initially born and later developed. Inherited talent in sports facilitates environmental factors that, if present, guide the talented player towards achieving championship status (Al-Din Radwan, 2017).

Othman (2019) points out that selecting talented athletes is the first step in the proposed hero-making strategy. This process involves an integrated system of sub-measures designed to differentiate among large groups of children, teenagers, and young adults who are athletically distinguished, identifying those with elements of future genius. Selection is a means of creating sports heroes who can achieve excellence in specialized sports through objective, scientific differentiation (Othman, 2019; Al-Din Radwan, 2017).

Moayed Ali (2022) confirms that building an optimal model for athlete development requires understanding and applying sound scientific selection methods and specialized guidance for young athletes. Al-Fartusi & Al-Maidini (2022) add that selecting and guiding young athletes from the beginning, based on their specific preparations and abilities, allows for predicting the impact of training on their development. This process is essential for continuous progress in their sporting activity (Al-Fartusi & Al-Maidani, 2022).

Research indicates that global hero-making projects have two main components. First is the "selection system," which includes medical, physical, skill, psychological, and anthropometric tests to identify emerging talent in early stages (Kharbit & Othman, 2023).

Specialists in various sports have turned to previous studies and research to define the specifications for each activity. This helps in selecting young athletes based on scientific principles to reach higher sports levels. The selection process involves various aspects tailored to the requirements of each sport. The goal is to identify talented individuals with unique aptitudes based on primary genetic indicators. For instance, football, a team sport characterized by continuous action and competition, relies on speed, performance level, and morphological specifications. Studying these aspects, including physical and skill attributes, reflects the scientific progress in the field of football.

The scientific method is one of the most important tools for developing human societies. Through scientific research, existing problems are identified and precisely defined, enabling officials to achieve results that may help solve these problems, leading to societal progress and development. Sport is a key area of human activity aimed at personal development, and sporting excellence in international and Olympic arenas has become a significant indicator of a country's progress, particularly in the modern era (Al-Din Radwan et al., 2017).

Modern football is experiencing significant development in various aspects of preparation globally. However, Algerian football requires substantial attention and follow-up. Observations indicate a decline and instability in performance, leading to poorer results at both international and local levels across all categories. A major concern is that nearly 70% of Algerian players are trained abroad, indicating that the domestic football championship and professional clubs are failing to develop players who can effectively represent the national team. Despite the National Federation's efforts to advance football training at the club level and the Algerian state's support for football, these issues persist.

Studies and research have highlighted that one key reason for the low performance level is the failure to use scientific theories, information, and methods when selecting athletes, especially at an early age. This issue is supported by previous local studies, such as a study by Bengoua (2004), which found a lack of adherence to scientific foundations in the selection process, resulting in subjectivity and spontaneity. This has led to a lack of an accurate and objective profile for selecting young talents with the potential for future brilliance in Algerian football (Haroune, Ali & Chachou, 2023).

Given this context, the importance of this study lies in identifying the root causes of these issues and proposing realistic solutions based on a thorough analysis of the data. This study aims to identify the key morphological (anthropometric) measurements, physical characteristics, and skills necessary for selecting young football players in the under-13 age group who have the potential for future excellence. This will be achieved by consulting experts and specialists to determine which factors are most crucial for predicting future success in football.

2. METHODS

2.1. Study Design and Participants

This study used a descriptive survey method. In this study, the sample was intentionally or purposively selected and initially consisted of 50 experts, specialists, and academic professionals

with advanced knowledge in the fields of sports training, testing, and measurement, specifically focusing on football in the Arab world. A total of 50 questionnaires were distributed, and 38 were returned, yielding a 74% response rate, which is considered acceptable for scientific research purposes. Thus, the final sample included 38 participants.

2.2. Instrument

A questionnaire was designed as a key tool for data collection in this study, aiming to gather information from experts and specialists regarding the core issues addressed by the research. The questionnaire was distributed both in physical and electronic formats. For physical distribution, the questions were prepared in a Word document, printed, and delivered directly. For online distribution via email and Facebook, it was converted into a digital format using Google Forms.

The questionnaire was divided into two main sections:

1. Part One: This section collected personal information about the respondents, including their name, surname, email, academic degree, and university affiliation.
2. Part Two: This section comprised 37 statements divided into three main axes that reflected the central problem investigated by the study. These axes addressed key study variables, each item designed to measure specific aspects of the research questions (Table 1).

Table 1. Distribution of questionnaire statements across study axes

Study Topics	Number of phrases
Morphological Requirements	18
Physical requirements	10
Skill requirements	9
Total sum of the phrases	37

The five-point Likert scale was used in this study for its expressiveness and flexibility, allowing participants to rate their agreement with each statement on a scale from 1 to 5. The scale ranges from highly important (5) to not important (1), offering a wide scope for responses. The numerical interval between each point is 0.80, which is added to the starting value of 1 to calculate the weighted average. This average helps determine the overall tendencies of the participants' responses. The following table (Table 2) presents the five-point Likert scale and the corresponding weighted averages:

Table 2. Five-point Likert scale responses and weighted averages

The weight	Weighted average	The answer
01	From [1.00 to 1.80]	Not important
02	From [1.81 to 2.60]	Weakly important
03	From [2.61 to 3.40]	Moderately important
04	From [3.41 to 4.20]	Important
05	From [4.21 to 5.00]	Highly important

2.3. Psychometric Properties of the Study Tool

2.3.1. Validity of the study tool

- **Apparent Validity:** The apparent validity was assessed by having a group of professors review the questionnaire. They evaluated the clarity of each statement, its relevance to its respective dimension, and overall coverage of the study's variables. They also suggested necessary amendments, deletions, or additions.
- **Internal Consistency:** Internal consistency measures how well each statement relates to its axis. Pearson's linear correlation coefficient was used for this assessment. The correlation coefficient values are interpreted as follows:
- A coefficient of 000 indicates no correlation.
- A positive coefficient signifies a direct correlation, strong when close to 111 and weak when near 000.
- A negative coefficient indicates an inverse correlation, strong when close to −1-1−1 and weak when near 000.

Tables 3, 4 and 5 show the internal consistency results for each axis, with correlation coefficients significant at $\alpha=0.05\alpha = 0.05\alpha=0.05$.

Table 3. Internal consistency validity results for the first axis (morphological requirements axis)

Dimension	No.	Ferries	Pearson correlation	*p* value
Morphological requirements	1	Weight	0.853	0.000
	2	Total body length	0.857	0.000
	3	Arm length	0.859	0.000
	4	Humerus length	0.741	0.000
	5	Forearm length	0.893	0.000
	6	Palm length	0.853	0.000

	7	Torso length	0.796	0.000
	8	Leg length	0.800	0.000
	9	Foot length	0.684	0.000
	10	Shoulder circumference	0.698	0.000
	11	Chest circumference	0.736	0.000
	12	Abdominal circumference	0.761	0.000
	13	Thigh circumference	0.708	0.000
	14	Upper arm circumference	0.714	0.000
	15	Forearm circumference	0.618	0.000
	16	Calf circumference	0.747	0.000
	17	Body mass index (BMI)	0.918	0.000
	18	Body fat percentage	0.940	0.000

We observe from Table 3 that all statements show a significant correlation with the first axis (morphological requirements) at the 0.050.050.05 significance level. Therefore, the field is considered to accurately measure what it was designed to assess.

Table 4. Internal consistency validity results for the second axis (physical requirements)

Dimension	**No.**	**Ferries**	**Pearson correlation**	***p value***
Physical requirements	1	Reaction speed	0.703	0.000
	2	Transitional speed	0.720	0.000
	3	Kinetic speed	0.822	0.000
	4	Bearing performance	0.700	0.000
	5	Power distinguished by speed	0.787	0.000
	6	Explosive strength of the lower extremities	0.799	0.000
	7	Explosive strength of the upper extremities	0.809	0.000
	8	Flexibility	0.806	0.000
	9	Compatibility	0.818	0.000
	10	Agility	0.880	0.000

We observe from Table 4 that all statements have a significant correlation with the first axis at the 0.050.050.05 significance level, indicating that the field accurately measures what it was designed to assess. Table 5 also shows that all statements have a significant correlation with the first axis at the significance level (0.05).

Table 5. Validity of the internal consistency of the third axis (skill requirements)

Dimension	No.	Ferries	Pearson correlation	*p* value
Skill requirements	1	Ball control	0.756	0.000
	2	Dribbling with the ball	0.749	0.000
	3	Running with the ball	0.703	0.000
	4	Short scroll	0.749	0.000
	5	Long scroll	0.695	0.000
	6	Heading the ball	0.739	0.000
	7	Control the ball	0.737	0.000
	8	The force of throwing the ball	0.692	0.000
	9	Aiming accuracy	0.804	0.000

2.3.2. Stability of the study tool

The reliability of the questionnaire refers to the accuracy and consistency of its results. If the questionnaire is administered multiple times under the same conditions to the same group, reliable results should be consistent or very similar. The reliability of the questionnaire was assessed using Cronbach's Alpha coefficient, as detailed in the Table 6.

Table 6. Cronbach's Alpha test results for measuring questionnaire reliability

Interviewer	Number of phrases	Stability coefficient	Reliability coefficient (alpha value)
The first axis: morphological requirements	18	0.773	0.882
The second axis: physical requirements	10	0.897	0.948
The third axis: skill requirements	09	0.801	0.894
Complete form	37	0.891	0.943

From the table above, it is noted that Cronbach's alpha values are high across all aspects of the questionnaire: 0.773 for the first axis, 0.897 for the second axis, and 0.801 for the third axis. The overall Cronbach's alpha for all statements is 0.891, exceeding the minimum acceptable value of 0.6. This indicates the questionnaire's reliability, suitability for analysis, and consistency of the results.

2.3.3. Objectivity of the study tool

The testers had complete freedom so that the research staff did not interfere in directing or in the results of the questionnaire, which confirms the objectivity of the tool.

2.4. Statistical Analysis

Data analysis was conducted using SPSS with both descriptive and inferential statistical methods. Descriptive statistics, including frequency distribution, percentages, arithmetic mean, and standard deviation, were employed to summarize demographic data and rank items based on their importance. These methods provided insights into the characteristics of the study population and the dispersion of values from the mean.

For inferential analysis, Cronbach's alpha coefficient was used to evaluate the reliability of the study tool, with acceptable values above 0.6. Pearson's correlation coefficient assessed the strength of relationships between variables. Frequencies and percentages further described the population characteristics and responses to the study tool. These methods ensured a comprehensive analysis of the data and supported the validity of the findings.

To determine the relative importance, the following calculations were performed:

1. **Maximum Value of Agreement:** This is computed as the product of the number of experts and the maximum value of significance, which is 5×38=1905 \times 38 = 1905×38=190.
2. **Half the Value of Relative Importance:** This value is 191919.
3. **Minimum Value of Relative Importance:** Calculated as half the maximum value of agreement plus half the value of relative importance, resulting in 95+19=11495 + 19 = 11495+19=114.
4. **Percentage of Relative Importance:** The relative importance percentage is then derived from the formula, resulting in 114190×100=60%\frac{114}{190} \times 100 = 60\%190114 ×100=60%. This indicates that the relative importance percentage is 60%.

3. RESULTS AND DISCUSSION

First, we present the results of the first axis: the morphological requirements axis (Table 7). For morphological abilities and aptitudes, experts showed a high degree of importance for certain measurements.

Table 7. The results of the first axis (the morphological requirements)

Dimension	No.	Ferries	M	SD	Degree level of Importance	Agreement rate%		Significance level
Morphological requirements	1	Weight	4.421	0.721	Highly important	88.42%	The weighted relative importance percentage is 60%	acceptable
	2	Total body length	4.280	0.802	Highly important	85.78%		acceptable
	3	Arm length	2.000	0.657	Weakly important	40.00%		unacceptable
	4	Humerus length	1.973	0.677	Weakly important	39.47%		unacceptable
	5	Forearm length	2.000	0.697	Weakly important	40.00%		unacceptable
	6	Palm length	1.860	0.664	Weakly important	37.37%		unacceptable
	7	Torso length	3.078	0.941	Average importance	61.57%		acceptable
	8	Leg length	3.078	0.941	Average importance	61.57%		acceptable
	9	Foot length	2.789	0.810	Average importance	55.78%		unacceptable
	10	Shoulder circumference	2.236	0.714	Weakly important	44.73%		unacceptable
	11	Chest circumference	3.394	0.886	Average importance	67.89%		acceptable
	12	Abdominal circumference	3.131	0.704	Average importance	62.63%		acceptable
	13	Thigh circumference	3.184	0.800	Average importance	63.68%		acceptable
	14	Upper arm circumference	2.105	0.727	Weakly important	42.10%		unacceptable
	15	Forearm circumference	2.000	0.735	Weakly important	40.00%		unacceptable
	16	Calf circumference	3.052	0.612	Average importance	61.05%		acceptable
	17	BMI (BMI)	4.447	0.601	Highly important	88.95%		acceptable
	18	Body fat percentage	4.394	0.594	Highly important	87.89%		acceptable

The body mass index (BMI) received the highest rating, with an arithmetic mean of 4.447 and a standard deviation of 0.601, indicating its significant role in the selection process. Experts believe that BMI is one of the most important morphological measurements that is relied upon during the selection process. BMI was followed by body fat percentage (statement 18) with a mean of 4.394 and a standard deviation of 0.594, highlighting its importance for U-13 soccer players. Total body weight (statement 1) also ranked highly with a mean of 4.42 and a standard deviation of 0.721. Body length (statement 2) had a mean of 4.28 and a standard deviation of 0.602.

In contrast, measurements such as chest circumference, abdominal circumference, thigh circumference, leg length, torso length, and calf circumference were considered of average importance. Chest circumference had the highest mean in this group at 3.394 with a standard deviation of 0.886, followed by abdominal circumference (mean 3.31, SD 0.704), and leg length and torso length (mean 3.78, SD 0.941). Calf circumference ranked lowest with a mean of 3.052 and a standard deviation of 0.612. Table 8 presents the results of the second axis: the physical requirements axis.

Table 8. The results of the second axis (the physical requirements axis)

Dimension	No.	Ferries	SMA	SD	Degree level of importance	Agreement rate %		Significance level
Physical requirements	1	Reaction speed	4.223	0.675	Highly important	84.73%	The weighted relative importance percentage is 60%	acceptable
	2	Transitional speed	4.578	0.551	Highly important	91.57%		acceptable
	3	Kinetic speed	4.368	0.819	Highly important	87.36%		acceptable
	4	Bearing performance	4.447	0.724	Highly important	88.94%		acceptable
	5	Power distinguished by speed	4.184	0.800	Important	83.68%		acceptable
	6	Explosive strength of the lower extremities	4.684	0.525	Highly important	93.68%		acceptable
	7	Explosive strength of the upper extremities	3.026	0.752	Average importance	60.52%		acceptable
	8	Flexibility	4.447	0.554	Highly important	88.94%		acceptable
	9	Compatibility	4.552	0.645	Highly important	91.05%		acceptable
	10	Agility	4.884	0.619	Highly important	97.89%		acceptable

We observe from the table above, which represents the statements related to physical requirements, that experts place high importance on several physical attributes, including agility, explosive power of the lower extremities, transitional speed, flexibility, performance endurance, kinetic speed, and force characterized by speed. Agility received the highest mean score of 4.884 with a standard deviation of 0.619, indicating its crucial role in the selection process for U-13

football players. Al-Din Radwan (2017) highlights its importance as a basic requirement for all positions.

Following agility, the explosive strength of the lower extremities ranked second with a mean of 4.684 and a standard deviation of 0.525. This has been corroborated by studies indicating its essential role in various football skills and positions (Al-Din Radwan, 2017). Transitional speed ranked third with a mean of 4.578 and a standard deviation of 0.551, underlining its significance in U-13 football selection.

Compatibility ranked fourth with a mean of 4.552 and a standard deviation of 0.645. Flexibility followed with a mean of 4.447 and a standard deviation of 0.554. Performance endurance ranked sixth with a mean of 4.447 and a standard deviation of 0.724, reflecting its importance for enduring long matches. Kinetic speed ranked seventh with a mean of 4.368 and a standard deviation of 0.819. Fast reaction ranked eighth with a mean of 4.184 and a standard deviation of 0.800, followed by force characterized by speed at ninth with the same mean and standard deviation. Finally, explosive strength of the upper extremities ranked tenth with a mean of 3.028 and a standard deviation of 0.752, reflecting its moderate importance according to expert opinions. Table 9 presents the results of the third axis: the skill requirements axis.

Table 9. The results of the third axis (the skill requirements axis)

Dimension	No.	Ferries	SMA	SD	Degree level of importance	Agreement Rate		Significance level
Skill requirements	1	Ball control	4.763	0.489	Highly important	95.26%	Weighted relative importance percentage 60%	acceptable
	2	Dribbling with the ball	4.736	0.554	Highly important	94.73%		acceptable
	3	Running with the ball	4.578	0.683	Highly important	91.57%		acceptable
	4	Short scroll	4.631	0.633	Highly important	92.63%		acceptable
	5	Long scroll	4.394	0.789	Highly important	87.89%		acceptable
	6	Heading the ball	2.921	0.881	Average importance	58.42%		unacceptable
	7	Quenching and Control the ball	4.500	0.725	Highly important	90.00%		acceptable
	8	The force of throwing the ball	3.894	1.060	Important	77.89%		acceptable
	9	Aiming accuracy	4.710	0.581	Highly important	94.21%		acceptable

Scoring

We observe from the table on skill capabilities and aptitudes that experts assign a high degree of importance to several football skills: ball control, running with the ball, dribbling, and shooting accuracy. The skill of ball control received the highest mean score of 4.763 with a standard deviation of 0.489, followed by dribbling with a mean of 4.736 and a standard deviation of 0.554. This highlights the high importance of ball control and dribbling for U-13 football players.

Dribbling is crucial for situations where passing is not an option, such as when teammates are closely marked or when facing an offside trap. The skill of shooting accuracy ranked third with a mean of 4.710 and a standard deviation of 0.581. Short passing ranked fourth with a mean of 4.631 and a standard deviation of 0.633, reflecting its vital role in gameplay and tactical execution.

Running with the ball ranked fifth with a mean of 4.578 and a standard deviation of 0.683. Ball control was ranked sixth with a mean of 4.500 and a standard deviation of 0.725. Long passing ranked seventh with a mean of 4.394 and a standard deviation of 0.789. Throwing strength ranked eighth with a mean of 3.894 and a standard deviation of 1.60, while heading the ball was ranked ninth with the lowest mean of 2.921 and a standard deviation of 0.881

4. CONCLUSIONS

In light of the study aim and within the limitations revealed by the study, particularly from the questionnaire responses provided by expert doctors, the research team determined that requirements meeting or exceeding a 60% importance threshold were to be considered. Requirements falling below this threshold were rejected. Using the content validity method and the agreement of expert doctors, the team identified the priority requirements for selecting football players under 13 years old.

The following requirements were deemed highly important:

- **Morphological Requirements**: Body Mass Index (BMI), body fat percentage, total body weight, total body height.
- **Physical Abilities**: Agility, coordination, explosive power, lower extremity strength, transitional speed, flexibility, endurance, motor speed (speed-strength).
- **Basic Skills**: Ball control, running with the ball, dribbling, shooting accuracy, ball retention, short passing, long passing.

5. RECOMMENDATIONS

To enhance the selection of emerging football talents under 13 years old, it is crucial to rely on the identified morphological, physical, and skill requirements. Adhering to scientific methods and incorporating field studies as references will ensure a rigorous selection process. Emphasizing scientific foundations will help prevent the loss of potential talent. Additionally, improving trainer effectiveness through seminars and training sessions on objective evaluation methods is essential. Future research should involve larger samples and diverse age groups to validate findings, and developing a strategy based on scientific principles will aid in talent identification. Establishing local standards for younger age groups in football will provide practical benchmarks for fieldwork.

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AUTHOR CONTRIBUTIONS

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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