

# The contribution of physical fitness components (strength and speed) to the accuracy of the performance of basic skills (dribbling and scoring) of football players in Constantine schools teams

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## ABSTRACT

The current study aims to find out the extent of the contribution of physical fitness components (strength and speed) in the performance of basic skills (dribbling and scoring) among football players of the secondary school teams at the ages of (15-18 years). The researcher used the descriptive approach and he assumed the following:

-The existence of a significant correlation between physical fitness components (strength and speed) and basic skills (dribbling and scoring) among high school football players.

-Physical fitness components (strength and speed) contribute significantly to the accuracy of basic skill performance (dribbling and scoring) among high school football players.

To collect data we used physical tests (the five-jump test to measure strength, and the 20-meter sprint test to measure speed) and skill tests (accuracy scoring test to measure scoring skill, and the 25-meter Zig-Zag dribbling test to measure dribbling skill)

We applied the study on a sample of 50 players representing 22.32% of the research population, who were selected randomly.

After statistical analysis using SPSS software and relying on a set of statistical tools, the researcher concluded that physical fitness components (strength and speed) contribute to the performance of basic skills (dribbling and scoring) to varying degrees among high school football players.

Based on the findings, the following recommendations can be made:

- Identify and develop the correlations between the physical and skill aspects to achieve a high level of skill performance.
- Conduct numerous studies to determine the extent to which physical qualities contribute to each fundamental skill in football, to utilize the findings during training to enhance the skill performance level of football players.

## Keywords

physical fitness; basic skills; football; school teams.

## Introduction and Problem:

Physical education (PE) is an integral part of the school curriculum, historically promoting the "healthy body, healthy mind" philosophy alongside more cognitive subjects. School sports (SS), while not taking place within the set curriculum and happening outside of school hours, still involve structured learning. These differences make PE and SS separate topics, but both are important for a child's learning and development through physical activity.

Football, one of the world's most popular sports, holds a special place in Algerian school sports, with students of all ages participating. A football player's success depends on complex skills, the most important aspects for young players' game performance. These factors can be used to differentiate between elite players, those with

potential to reach the elite level, and those who are unlikely to do so (Honer & AL, 2017).

For a player to perform well physically and skillfully, fitness is crucial in executing skills. Therefore, a player's physical and skill development is the core pillar in football. As (Alhiyali & Ashameri, 2010) point out, the process of matching skills with fitness components is necessary to reach higher sporting levels.

As with any other sport, physical preparation is a cornerstone of success or failure for football players. Physical fitness can be defined as a set of characteristics that an individual possesses or develops that relate to their ability to perform physical activity. In football, physical fitness encompasses a wide range of components, including: Body composition, Muscular strength, endurance, Flexibility, Agility, Balance,

Coordination, Reaction time, Speed..., These measurable characteristics are interrelated and have been shown to have a significant positive association with improved outcomes in physical activity, such as participation in football (Jessika, et al., 2024)

(Hanafi, 1974) sees that the trainer must work to develop the physical characteristics of the player that go with the modern play requirements. In this domain, the physical training is linked to the drills of football basic skills.

Skill development is another crucial aspect for football players. Mastering key skills like passing, dribbling, shooting and scoring equips them to execute defensive and offensive tactics effectively. Daily training plans should prioritize fundamental skills, as they form the foundation for successful play in any position on the field (Malina, Basil, Joao, & Sean, 2007)

Dribbling is a fundamental skill for footballers in both attack and defense due to the constant need for rapid movement (Sawadi , 2019), To master this skill, the player must possess high physical fitness, which includes speed, strength, and endurance. Similarly, scoring is another crucial skill, depends on a set of physical abilities that can be improved through training. (Alhiyali & Ashameri, 2010)

Drawing upon the aforementioned discourse, this research seeks to determine the degree to which physical fitness components (strength and speed) influence the execution of fundamental skills (dribbling and scoring) by football players within secondary school teams.

#### **Sub-questions:**

1. Is there a significant correlation between physical fitness components (strength and speed) and the basic skills (dribbling and scoring) of football players of secondary school teams?
2. Do the physical fitness components contribute to the exactitude of the performance of basic skills (dribbling and scoring) of football players of secondary school teams?

#### **General hypothesis:**

- Physical fitness components (strength and speed) significantly influence the accuracy and effectiveness of basic skills (dribbling and

scoring) among football players in secondary school teams.

#### **Sub-hypotheses:**

- There is a correlation between the physical fitness components (strength and speed) and the basic skills (dribbling and scoring) of football players of secondary school teams.
- The physical fitness components (strength and speed) contribute hugely to the basic skills (dribbling and scoring) of football players of secondary school teams.

**Scientific importance of the research:** This research is one of the scientific attempts to determine the extent to which physical qualities contribute to each basic skill in football, to use the findings during training to enhance the skill performance level of football players.

**Applied importance of the research:** The results of this research can contribute to improving the player's performance by identifying his physical needs to enhance his basic skills, and The study's results can help identify players with high levels of physical fitness and basic skills, allowing for a focus on intensive development, It can also help guide development programs and support scientific research on this topic.

**Research objectives:** To investigate the relationship between physical fitness components (strength and speed) and the accuracy of basic skill performance (dribbling and scoring) among football players in school teams, and to identify the specific physical fitness components that have the most significant impact on dribbling and scoring accuracy.

#### **Definition of research terms:**

##### **physical fitness:**

Numerous studies have explored defining physical fitness, with Table 1 showcasing some examples:

**Table 1.** traditional definition of physical fitness (Russel , 1988)

Author	Definition
Darling et al, 1948	The individual’s functional capacity for a task.
Karpovich, 1965	The degree of the ability to execute a specific physical task under specific ambient conditions.
Clarke, 1967	The ability to carry out daily tasks with vigor and alertness, without undue fatigue, and with ample energy to enjoy leisure time pursuits and to meet unforeseen emergencies.
Fleishman, 1964	Functional capacity of individuals to perform certain kinds of tasks requiring muscular activity.
Casperson et al, 1985	A set of attributes that people have or achieve that relates to the ability to perform physical activity.

After careful consideration, we have adopted the following definition as a general definition of physical fitness: physical fitness is the ability to perform strenuous physical activity traits and capacities that are consistent with minimal risk of developing hypokinetic diseases. (Russel R., 2016)

But in football we have adopted the following definition of physical fitness: is defined as the physical ability of a player to perform all the skills and duties required of them during a match in the best possible way, while maintaining a high level of performance throughout the duration of the game.

**basic skills:**

This refers to all the skills in football either with or without the ball. The player makes these skills according to the code of the game. The skill is defined as the movements that must be made in all the situations the game requires to reach the best results with the least effort. (Bouhadj, 2012)

**school teams:**

Zeroual defines the school team as a group of students representing their institution in various sportive fields including football. Each sportive institution establishes a sport association that is in charge of preparing the sport teams to compete the other institutions. (Zeroual, 2017)

**Literature review:**

**The study of Rashem Jamel Eddine (2019):**

It is a PhD thesis entitled “the effect of the drills related to the circular training style on the

development of some physical abilities related to the shooting skill of the football cadet players”.

The study aimed at:

1.Preparing drills related to the circular training style on the development of some physical abilities related to the shooting skill of the football cadet players.

2.Revealing the relation between some physical abilities and the shooting skill.

The author used the descriptive method. His sample included 32 players from al Hashemia and al Akhdarya Star clubs who had been chosen at random. He applied a set of physical and skill tests. After statistical analysis, he found that:

1.The drills prepared by the author had been effective in developing some physical abilities related to the shooting skill of the football cadet players.

2.There is a direct relation between the physical abilities under study and the skill of shooting of the football cadet players.

**The study of Najmaoui Khaled et al., (2019)**

It is a paper entitled “the effect of developing the physical abilities (endurance, speed, flexibility) and its relation with the development of the technical abilities (ball control, dribbling, bouncing the ball) of football benjamins”. It aimed at:

1.Revealing the effect of developing the physical abilities (endurance, speed, flexibility) and its relation with the development of the technical abilities (ball control, dribbling, ball bouncing) of football benjamins U-10.

The authors used the descriptive method. The sample included 20 benjamin players who had been chosen at random from Annacha Assaid association of al Attaf municipality in the Wilaya of Ain Defla in Algeria. The authors used a set of physical and skill tests. After statistical analysis, they found that:

1. There are statistically significant differences between the dimensional tests for the pilot sample
2. There is a significant correlation between the physical abilities (endurance, speed, flexibility) and the technical abilities (ball control, dribbling, ball bouncing) of football benjamins U-10.
3. The development the physical abilities (endurance, speed, flexibility) has a positive effect on the technical abilities (ball control, dribbling, ball bouncing) of football benjamins U-10.

#### **The study of Rashem & Bouhadj (2018):**

It is a paper entitled “determining the rate of the contribution of the explosive strength trait to the shooting skill of football juniors U-16”.

The study aimed at:

Determining the rate of the contribution of the explosive strength trait to the shooting skill of football juniors.

The authors used the descriptive method. The sample included 16 players from Amal al Hasehmya team who had been chosen at random. The authors applied the tests of the explosive power and shooting.

After statistical analysis, they found:

1. A statistical correlation between the explosive strength and the shooting skill of football juniors
2. The rate of the contribution of the explosive strength to the shooting skill was good.

#### **The study of Aboud et al., (2012):**

It is a paper entitled “the relation of the maximum speed with the speed of performing dribbling and stall in football”. The study aimed at:

1. Knowing the extent of the relation between the maximum speed and the speed of performing the skill of dribbling with the ball.
2. Knowing the extent of the relation between the maximum speed and the speed of performing stall skill.

The authors used the descriptive method. The sample included 10 players from al Karkh team who had been chosen at random. The authors

applied a set of physical and skill tests. After statistical analysis, they found:

1. A random correlation between the maximum speed and the speed of dribbling and stall.
2. The players who have high speed do not necessarily have speed of dribbling in football.
3. The players who have high speed do not necessarily have the speed of stall in football.

#### **Method of the study:**

To achieve the objectives of this study, which focused on understanding the contribution of some physical fitness components to the accuracy of some basic skills of football players, we employed a descriptive methodology. This approach allowed us to gather and analyze data on the current state of these fitness components and their relationship with skill performance. This foundational understanding will pave the way for further research exploring potential interventions to improve player performance.

#### **Study population and sample:**

The population of the study is made up of the football players in secondary school teams of Constantine. It includes 224 players. On the other hand, the sample included 50 players with a rate of 22.32 of the population of the study. They had been chosen at random.

#### **Study tools:**

In this study, the researcher relied on tests to measure the physical and skill variables, and we had a look on the previous studies that tackled the same age category 15-18 years old and on the theoretical literature that discussed the measurement and evaluation.

In order to evaluate the physical and skill levels of the participants, a comprehensive testing protocol was implemented. This protocol included a battery of standardized tests designed to measure both physical fitness components and football-specific skills.

The tests order reflects the primary energy systems used by athletes in football. Tests are sequenced based on their dominant energy source

#### **-The five-Jump test: (Chamari, et al., 2008)**

Aim of the test: measuring the strength characterized with speed of the legs muscles.

**Tools:** start line, measuring tape, and cones.

#### **Descriptions of the performance:**

-The athlete stands behind the start line.  
 -When the referee gives the start signal, the athlete makes 5 big steps

**Recording:** the distance achieved by the athlete after 5 jumps is recorded.

**-The 20 m sprint test:** (Walker, 2024)

**Aim of the test:** measuring the transitional speed.

**Tools:** a stopwatch, whistle, a distance of 20 meters specified with 02 parallel lines (the first is the start line while the second is the finish line), cones.

**Descriptions of the performance:** the athlete stands behind the line of start taking the standing start position. When he hears the start whistle, he runs as fast as he can till the finish line.

**Performance conditions:** Many athletes take up the test at the same time.

**Recording:** The time spent by the athlete is recorded in seconds.

**-Accuracy scoring test:** (Jamal, 2014)

**Aim of the test:**

Measuring the accuracy of shooting on different points of the goal.

**Tools:**

Football goal divided into 6 equal parts, balls, and a point that is 12 m far from the center of the goal.

**Description of the performance:**

- The ball is put on a point that is 12m far from the goal. The coach determines one of the six points. Then, the player advances and shoots.
- The player shoots 10 times in different zones.
- The player is allowed to kick the ball with any part of the foot.

**Recording:**

- The player gets a point for each ball that reaches the required zone.
- The player is given only one trial.

**Zigzag dribbling 25m test:** (Evangelos, Loannis, & Stylianos, 2018)

**Aim of the test:**

Measuring the special fitness (controlling the body with the ball when moving).

**Tools:**

A flat stadium, 05 pillars, and a stopwatch.

**Description of the performance:**

We put the pillars in one straight line all along the stadium with 1m between each 02 pillars. The distance between the 1st pillar and the start line is 4.5m. When the start signal is given, the player runs between the pillars and comes back the same way.

**Recording:**

The player tries to record the least possible time.

**Regularizing the physical and skill tests used in the study:**

**Reliability:**

To extract the coefficient of reliability, we used the method of testing and retesting on 11/10/2021 and 14/10/2021 on a pilot sample that included 10 players who had been excluded from the main sample of the study. The coefficient of reliability between the two applications had been calculated using Pearson correlation coefficient.

**Validity:**

To know the validity of the used physical and skill tests, we calculated the square root of the consistency coefficient. Table 02 shows the coefficients of consistency and validity of the used tests:

Physical tests	Coefficient of correlation	Probability of the coefficient of correlation	validity
The five-Jump test	0.94	0.000*	0.97
The 20 m sprint test	0.97	0.000*	0.98
Accuracy scoring test	0.99	0.000*	0.99
Zigzag dribbling	0.96	0.000*	0.98

25m test

**Table 2.** The suitable tests for the chosen physical characteristics

Source: prepared by the authors based on the outcomes of SPSS. \*Significant at error rate of 0.05

From Table 02, we see that the Probability of the coefficient of correlation between the first and second applications reached 0.000 for all the physical and skill tests. This indicates the consistency of the used tests. On the other hand, the values of validity ranged between 0.97 and 0.99 which are high values close to 01. This indicates the validity of the tests applied on the sample.

**Statistical tools:**

We analyzed data with SPSS. We used the following statistical tools: the arithmetic mean, the standard deviation, Shapiro Wilk test, Pearson

correlation coefficient, Spearman’s rank correlation coefficient, and the coefficient of determination.

**Presentation and analysis of the results:  
The descriptive statistics of the results of the physical and skills variables of football players of the secondary school teams:**

To make statistics of the results of the physical and skills variables of football players of the secondary school teams, we used the following statistical tools: the arithmetic mean, the standard deviation, and Shapiro Wilk test.

Table 03 shows the results:

**Table 03.** The descriptive statistics of the results of the physical and skills variables of football players of the secondary school teams

Physical tests	Arithmetic mean	Standard deviation	Shapiro probability
The five-Jump test	10.88	0.83	0.002
The 20 m sprint test	3.71	0.32	0.056*
Accuracy scoring test	8.46	1.58	0.000
Zigzag dribbling 25m test	10.14	1.59	0.000

**Source:** prepared by the authors based on the outcomes of SPSS. \*Significant at error rate of 0.05

From table 03, we see that Shapiro probability of five-Jump test, shooting on a goal, and dribbling which reached 0.002, 0.000, and 0.000 respectively is less than the error rate 0.05. This confirms that the data are not distributed naturally. On the other hand, we notice that the probability of Shapiro for The 20 m sprint test which reached 0.056 is bigger than the error rate 0.05. This indicates that the results are naturally distributed. In addition, we notice that the arithmetic mean of the football players in the school teams in the five-Jump test reached 0.88 and its standard deviation reached 0.83. As for The 20 m sprint test, the arithmetic mean reached 3.71 and the standard deviation of 0.32. Concerning the shooting on a

goal, the arithmetic mean was 8.46 and the standard deviation 1.58, As for the dribbling test, the arithmetic mean reached 10.14 while the standard deviation 1.59

**Presenting the result of the relation between physical fitness components (strength and speed) and the basic skills (dribbling and scoring) of the players of the secondary school football teams:**

To know the relation between physical fitness components (strength and speed) and the basic skills (dribbling and scoring) of the players of the secondary school football teams, we used Spearman’s rank coefficient. Table 04 shows the results:

**Table 04.** The relation between physical fitness components (strength and speed) and the basic skills (dribbling and scoring) of the players of the secondary school football teams

	Tests	scoring	Dribbling
strength	Spearman’s value	0.83	0.002
	Spearman’s probability	0.32	0.056*
speed	Spearman’s value	1.58	0.000
	Spearman’s probability	1.59	0.000

**Source:** prepared by the authors based on the outcomes of SPSS. \*Significant at error rate of 0.05

From table 04, we notice that Spearman’s probability which reached 0.000 between all the physical and skill variables is less than the error rate 0.05. This indicates the existence of a significant correlation between the strength and speed and the skills of dribbling and scoring. This correlation has a reflexive nature between the characteristic of strength and skill of dribbling and the characteristic of speed and skill of shooting. This is through referring to the sign of Spearman’s rank coefficient.

In addition, there is a direct relation between the characteristic of power and the skill of shooting, and the characteristic of speed and

skill of dribbling. This is indicated by the positive sign of the calculated value of Spearman.

**Presenting the results of the contribution of physical fitness components (strength and speed) in the accuracy of the performance of the basic skills (dribbling and scoring) of football players of secondary school teams:**

To know the extent of the contribution of physical fitness components (strength and speed) in the accuracy of the performance of the basic skills (dribbling and scoring) of football players of secondary school teams, we used coefficient of determination. Table 05 shows this:

**Table 05.** the contribution of physical fitness components (strength and speed) in the accuracy of the performance of the basic skills (dribbling and scoring) of football players of secondary school teams

	Tests	scoring	Dribbling
strength	Contribution extent	71.60%	60.90%
	Coefficient of determination probability	0.000*	0.000*
speed	Contribution extent	64.40%	55.30%
	Coefficient of determination probability	0.000*	0.000*

**Source:** prepared by the authors based on the outcomes of SPSS. \*Significant at error rate of 0.05

From table 05, we notice that probability of the

coefficient of determination which reached 0.000 between all the physical and skill variables is less

than the error rate 0.05. This indicates the existence of a significant effect of the strength and speed on the performance of the skills of dribbling and scoring. The rate of the contribution of strength and speed to the performance of the shooting skill reached 71.60% and 64.40% respectively while the rate of their contribution to the performance of the skill of dribbling reached 60.0% and 55.30% respectively.

### Discussion:

From tables 04 and 05, we found that the characteristics of speed and strength contribute to the performance of the skill of dribbling with 60.90% and 55.30%. This agrees with the studies of al Hayali and Ashemri (2010) and Mayd Shamel Kamel (2011). The latter confirms that the strength contributes effectively to the increase of the speed of dribbling as the suitability is direct between them (Kamel, 2011, p.61). Besides, Al Hayali & Ashemri pointed to the importance of strength characterized with speed and to the correlation with dribbling as this type of strength is necessary for the football player; therefore, the coaches devote a huge time to train on it. In addition, Abu al Ala Ahmed & Mohamed Nasreddine Radouane confirmed that the skill performance with low speed has its drawbacks as it cannot be felt. On the other hand, if the speed of the player is high, he can control the ball with a good skill performance (al Hayali & Ashemri, 2010, p.16).

Moreover, we found that strength and speed contribute to the performance of the skill of shooting with 71.60% and 64.40%. This agrees with the studies of Rashem (2019) and Rashem & Bouhadj (2018). According to Rashem (2019), Kacem found that the speed is the efficiency of the individual in performing consecutive similar movements in the least time possible. Hence, improving this characteristic which is one of the modern football requirements is one of the priorities of the sportive training as it has a

positive impact in the performance of the shooting skill.

In addition, Rashem (2019) reported that Moffoq (2008) found that the muscular strength contributes greatly to the performance of the player. The player's need for this strength manifests in the various situations of play such as long passes, jumping to hit the ball, and shooting on the goal (Rashem, 2019, pp. 168-169). Besides, Mohamed Jemaa Mohamed Karima et al. insisted on the importance of the muscular strength in football mainly in performing the kicks accurately and strongly from far distances (Karima et al., p.11). In the same context, Brahimi Kaddour et al., (2019) found that the speed characteristic manifests in each phase of the performance of the shooting skill.

Speed is involved in all the aspects of football such as the consecutive movements of scoring, the complex proceedings of receiving the ball and passing it, and the motor responses to the various and changing situations of the game. The players need the muscular strength in most of the match and in performing the various basic skills in football such as shooting on the goal, passing with all its types, running with the ball...etc

### Conclusion:

Physical fitness is one of the main determinants of football players to execute the skill performance with a high efficiency. Hence, the trainer must link the drills related to the Physical fitness with the drills of the basic skills to reach a high level of skill performance. Based on this, we conducted a study entitled "The contribution of physical agility elements (strength and speed) to the accuracy of the performance of basic skills (dribbling and scoring) of football players in school teams -field study at the secondary schools of Constantine".

Findings show that:

1. There is a significant correlation between physical fitness components (strength and speed) and the basic skills (dribbling and scoring) of football players of secondary school teams.
2. Physical fitness components (strength and speed) contribute to the accuracy of the performance of basic skills (dribbling and scoring) of football players of secondary school teams with varying levels.

Based on the findings, we recommend:

1. Determining the correlation between the physical and skill sides and developing it in order to reach a high level of skill performance.
2. Making studies that show the extent of the contribution of the physical characteristics to each of the basic skills related to football in order to take advantage of the results of the studies to improve the level of the skill performance of footballers.

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