El mohtaref journal of sports Science.Social And Human Science

vol (12) N° (02) (2025)

p 492–512

Search information

Received 27/06/2024
Accepted 05/06/2025

Printed ISSN: 2352-989X
Online ISSN: 2602-6856

A Comparative Study of Certain Physical Attributes of Football Players Across Different Age Groups at the End of the Physical Preparation Period

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ABSTRACT

The study aims to determine whether age group (under 17 and under 19) affects certain physical attributes by the conclusion of the physical preparation period among football players. The descriptive method was used on a sample of 20 players divided into two groups, selected intentionally, who are active in the Youth Club of the city of Tolga. Both age groups underwent tests for speed, strength, and endurance. After collecting and processing the data, it was found that age has an impact on strength and endurance but not on speed among the two groups.

Keywords: age group, physical attributes, physical preparation.

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INTRODUCTION

Khazaal (2014) states that football in our current era is the most popular game among the masses, which has increased its material, moral, and technical importance and prompted many clubs to invest in the game by searching for young talents at an early age and also paying attention to referees as they form a crucial axis for this game. Additionally, there has been a significant increase in interest in women's football around the world, accompanied by a great focus on various aspects such as body measurements and game requirements.

Experts confirm that different stages of growth, genetic factors, and the player's environment contribute to the advancement of their physical skills, and psychological levels. They believe that the stage from 4-12 years is suitable for developing and refining talent, while others consider the stage from 13-19 years to be the most appropriate for discovering and nurturing talents, leading to differing perspectives among football schools.

Specialists agree that the phase among 9 to 12 years is suitable for teaching basic skills, while at the age of 11, movements characterized by strength and speed can be introduced, ensuring they are regulated according to their capabilities. Many sports begin at an early age, but football is characterized by endurance and long training sessions, which pose a risk of overloading. This can affect the skeletal system, causing early deformities or potentially manifesting as injuries later on.

Al-Sayed (2008) defines modern sports training in football as an educational theory based on scientific principles to develop the player's functional, physiological, skills, psychological, and mental abilities in football, enabling them to perform their tasks with great efficiency and achieve the common goals of both the coach and the player.

The significant popularity of football at the local and international levels has led to extensive developments in research and scientific expertise, positively impacting the game. The technical level of sports teams has improved, and players now meet the physical, skillful, tactical, and other requirements of modern football, both individually and collectively, with a high degree of understanding and proficiency. Achieving this high level of physical fitness requires great sacrifice, endurance, and effort from the players.

Physical preparation involves equipping the player with elements of physical fitness, which are considered one of the pillars of skillful and tactical requirements. This is reflected in the player's ability to perform their tactical tasks with high quality.

Abdel Fattah and Shaalan (1994) state that the nature of performance in football varies according to playing positions and the team's playing strategy and tactics, both individually and collectively. Therefore, the value of planning and preparing for the training season, which takes into account the principle of individual differences among players, becomes evident. It reveals the physiological levels and abilities of each player, guiding them with appropriate training doses and enabling them to perform their tactical duties and meet the requirements of their playing positions. Since physiological capabilities differ from player to player, it is necessary to prepare training units that suit each player, considering their health status, cardiovascular and respiratory capacities, and recovery characteristics. These capabilities are assessed through various physical tests. Additionally, the chronological age and years of training should be considered when designing training loads. Maximum loads should not be utilized for young players to avoid damage to the spine and nervous system, ensuring there is an energy surplus for building processes and compensating for degradation processes.

From the above, it is evident that the performance requirements in football are of great importance. Therefore, they should be studied to find more ways to develop them by preparing training units and setting appropriate weekly, monthly, and annual training programs.

Al-Sayed (2008) states that physical fitness encompasses many health, psychological, and mental elements in addition to physical elements, which vary from one age group to another. Physical fitness is linked to an individual's health status, body composition, and the type of sports activity practiced. It is the cumulative result of the experiences a player acquires throughout their training career. Al-Sayed also says that experts have divided the components of physical performance to facilitate their study, regulate their loads, and develop specific tests and programs for their improvement. They differed in naming its components: Eastern Bloc scientists referred to them as physical attributes, while Western Bloc scientists called them physical elements. The disagreement extended to adding or omitting certain components of physical fitness.

From the previously mentioned knowledge background related to the variables of our study, we can see the importance of chronological and biological age and their connection to the physical performance requirements in modern football. We also see the physiological changes that occur in the human body during growth stages and their direct impact on the development of players' levels. This prompts us to raise the following question:

Study problem:

Is there an effect of the age group on the results of some physical attribute tests by the end of the physical preparation timeframe for soccer players?

Sub-Questions:

- Are there statistically notable variations in the speed assessment outcomes between the under 17 and under 19 age groups by the end of the physical preparation period for soccer players?
- Are there statistically notable variations in the strength assessment outcomes between the under 17 and under 19 age groups by the end of the physical preparation period for soccer players?
- Are there statistically notable variations in the endurance assessment outcomes between the under 17 and under 19 age groups by the end of the physical preparation period for soccer players?

Study Hypothesis:

There is an effect of the age group on the results of some physical attribute tests at the end of the physical preparation period for football players.

Sub-Hypotheses:

- There exist statistically notable variations in the speed assessment outcomes between the under 17 and under 19 age groups by the end of the physical preparation period for soccer players.
- There exist statistically notable variations in the strength assessment outcomes between the under 17 and under 19 age groups by the end of the physical preparation period for soccer players.
- There exist statistically notable variations in the endurance assessment outcomes between the under 17 and under 19 age groups by the end of the physical preparation period for soccer players.

Importance of the Study:

- The study aims to investigate potential differences in the results of physical attribute assessments among various age groups following the completion of a physical preparation period for soccer players. Specifically, it seeks to examine whether variations exist in speed, strength, and endurance assessment outcomes between the under 17(U17) and under 19 (U19) age groups at the end of the physical preparation period. The research will analyze speed metrics, strength performance, and endurance capabilities to determine if age-related

disparities emerge, thereby providing insights into the developmental progression of athletic attributes across these critical stages of player maturation.

Objectives of the Study:

- This study aims to determine whether there are statistically significant differences in the results of certain physical attribute tests among different age groups by the end of the physical preparation period for soccer players. Specifically, it seeks to identify variation in speed, strength, and endurance assessment outcomes between the under -17 and under-19 age groups. By analyzing these differences, the study aims to provide insights into the impact of age on physical performance, contributing to a better understanding of player development during the development during the preparation period.

2. Definition of Concepts and Terms:

2.1 Age Group:

- the age group refer to chronological age in this study, which consists of soccer athletes aged between 15 and 19 years. Salama (2009) states that age is the time period an individual lives from the day of birth to the last day of life. This period experiences several changes in the characteristics of the human body, resulting in changes in physical and functional abilities.

  Scientists have divided age into several different stages based on growth, with each stage having its unique characteristics, needs, and psychological and biological aspects. Among these stages is late adolescence and early adulthood. According to Marwan (2014), late adolescence ranges from 15-18 years and is referred to as the high school stage. During this period, the body reaches its maximum height and experiences lateral growth. Social, emotional, and cognitive changes are linked to physical and physiological changes, highlighting anatomical differences among genders. Males typically have larger bones and more muscle tissue, while females have a lower fat proportion, lower vital capacity, and are characterized by youth and feminine elegance. Engaging in physical activities or sports training for both genders at this stage plays a significant role in improving motor coordination, building the body, enhancing agility, and preventing obesity, muscle weakness, and stunted growth. During this stage, muscle strength, speed-related power, high jumping, and throwing abilities increase in males, although strength

endurance is less developed. For females, the development is less pronounced compared to males. Speed development peaks at ages 14-15 during early adolescence, reaching levels comparable to adults. According to Marwan (2014) early adulthood ranging from 18-30 years also known as the adulthood stage, is characterized by complete growth and mental and physical maturity. Performance is at its highest level of achievement and creativity during this stage, with significant development in physical attributes. However, there is a decline in these attributes, particularly among those who do not engage in any physical activity.

2.2 Physical Attributes:

According to Al-Sayed (2008), it is a term coined by Eastern Bloc scientists and encompasses several components such as speed, strength, endurance, flexibility, and agility. These are related to an individual's health and physical condition, the type of activity practiced, and training experience, forming a crucial foundation in the training process to elevate an athlete's performance, skill mastery, and tactical execution to the highest level of achievement.

It represents a critical basis for achieving the optimal physical condition of the player, upon which other training components and elements are built. The player's ability to achieve high-performance levels is linked to their physical capabilities, which include endurance, speed, and strength.

2.3 The Physical Preparation Period:

Al-Sayed (2008) defines physical preparation in its various stages as the enhancement of the player's physical attributes, equipping them with high fitness levels, and preparing them from all aspects, thereby contributing to the improvement of performance and meeting the game's skill and tactical requirements.

3. Previous Studies:

3.1 Study by Guerioune (2010)

Titled "The Effect of Chronological Age on Anaerobic Performance in Algerian Football Players," this research aimed to establish the impact of chronological age on the athletic performance of soccer players. The study included 12 senior players (22.8 ± 0.9 years) from a third-division club, 11 intermediate players (18.8 ± 0.2 years), and 33 junior players (16.3 ± 0.1 years) from the national team. All participants performed the Wingate test, which involves 30 seconds of maximum effort on a stationary bike (Monark Model

834 E) with a braking force of 75 g/kg^{-1} of body mass, and the vertical jump test on a force platform (Ergo Tester Globus Italy). The juniors had significantly lower average values of Wx ($p < 0.01$), Wx. Kg-1 ($p < 0.05$), Wan ($p < 0.05$), and vertical jump height ($p < 0.001$) compared to senior players, indicating the importance of sports age and its effect on the enzymatic activity of the anaerobic system.

3.2 Study by Ciorsac et al., (2010)

Entitled "Body Measurements and Physical Fitness of Soccer Players Participating in the Romanian Junior Championship" this study identifies the body measurement profile of novice soccer players participating in the Romanian league competition across two age groups compared to two sets of sedentary boys. The study also analyzes the correlation among physical fitness attributes and the body measurements of the youth soccer players.

There are two groups of youth soccer players: Group "A" consisting of 26 soccer athletes aged 18 to 19 years, and Group "B" consisting of 20 soccer athletes aged 16 to 17 years. The two control groups include 28 sedentary boys aged 16 to 17 years and 24 sedentary boys aged 18 to 19 years. The soccer athletes show normal adipose tissue content, excellent aerobic capacity, and efficient recovery ability following physical exertion. There are statistically significant differences ($p<0.05$) between the soccer athletes and the inactive male youths regarding adipose tissue proportion and body mass activity. The sedentary boys show elevated levels (over double the standard levels) for adipose tissue proportion and significant deficits in body mass activity. For the football players, there is a significant effect ($p<0.05$) based on age and skill level on leg muscle strength, velocity, quickness, and peak aerobic capacity. The physical fitness attributes improve with increased age and competitive level. A strong correlation is also observed among muscle fitness attributes and body measurements. These types of exercise assessments can be utilized for evaluating players.

3.3 Study by Manson et al., (2014)**:**

Entitled "Physiological Characteristics of Global Women's Soccer Athletes," this study aimed to examine the physiological traits of FIFA-eligible female soccer players aged 14 to 36 and to determine if there were notable differences in these traits among selected (starters) and non-selected (non-starters) players for the initial FIFA squad. The study involved fifty-one international female soccer players (18 under 17 years old; 18 under 20 years old; 15 seniors) who underwent a series of tests, including anthropometric measurements (height and body mass), lower body strength (isokinetic test),

running kinetics (non-motorized treadmill), leg power (unilateral jump), and maximal aerobic speed (30:15 intermittent fitness test) during the final preparatory phase for a FIFA event.

The data from the age groups show that players under 17 years old have distinct physiological capabilities compared to those under 20 and senior international players, indicating a stabilization of physical attributes as they age. Starters are generally faster (effect size [ES] = 0.55-1.0, $p<0.05$), possess higher maximal aerobic speed (ES = 0.78-2.40, $p<0.05$), and exhibit greater eccentric leg strength (ES = 0.33-1.67, $p<0.05$). Notable differences among starters and non-starters were observed in isokinetic leg strength (ES = 0.54-1.24, $p<0.05$) and maximal aerobic speed (ES = 0.87, $p<0.05$) for players under 17. For those under 20 and seniors, the primary distinguishing factor among starters and non-starters was maximal aerobic speed (ES = 0.83-2.45, $p<0.05$).

Coaches should focus on enhancing velocity, peak aerobic capacity, and leg strength in the training regimens of female soccer players.

3.4 Study by Nikolaidis et al., (2016)**:**

Entitled " Benchmark Metrics for Sprint Performance in Male Soccer Athletes Aged 9-35 Years," this study aimed to achieve two primary goals: first, to investigate the impact of age on 20-meter sprinting capability, and secondly, to provide standard reference data for 20-meter sprint performance across different ages in soccer players.

Anthropometric data for 474 male soccer players (mean age 16.81 ± 5.35 years, spanning from 9.02 to 35.41 years) were collected, and their 20-meter sprint proficiency, including splits for 0-10 and 10-20 meters, was measured using a photocell timing system (Brower Timing Systems, Utah, USA).

A one-way anova indicated notable disparities in sprint times across different age groups ($P < 0.001$, $\eta2 = 0.584$), including the 0-10 meter ($P < 0.001$, $\eta2 = 0.361$) and 10–20-meter splits ($P < 0.001$, $\eta2 = 0.635$). Older age groups performed superior to younger ones. The times recorded in the 20-meter sprint and the 0-10 meter and 10–20-meter splits exhibited moderate to strong correlations with the athletes' ages ($r = –0.53$, $–0.40$, and $–0.57$, correspondingly, $p < 0.001$).

In summary, sprinting performance in soccer players improved with age until peaking at 15 years. Beyond this age, players aged 16 to 35 showed no notable disparities in 20-meter sprint performance. The benchmark metrics provided within this research can assist soccer coaches and fitness trainers in tracking and developing players. Furthermore, being the first study to compare

adult age groups, it may serve as a valuable resource for sports scientists in future research.

3.5 Study by Slimani et al., (2017)**:**

Titled "Anthropometric and Physiological Characteristics of Male Soccer Players by Competitive Level, Playing Position, and Age Group: A Systematic Review," this review sought to identify the body measurements, physiological traits, and physical attributes of soccer players in relation to their competitive tiers, positions, and age categories.

A thorough search was carried out across various data repositories utilizing the Population/Intervention or Exposure/Comparison/Outcome (PICO) framework.

This review highlights that body composition, adipose tissue proportion (%), peak oxygen consumption (VO2max), capacity for repeated sprints (RSA), sprinting velocity, muscular strength, and lower limb muscle power are the primary distinguishing factors among male football athletes across various levels of competition, field positions, and age brackets. Notably, elite players exhibited higher VO2max, muscle strength, muscle power (vertical jump height), running speed (10-30 m), agility, and lower adipose tissue proportion compared to their sub-elite, amateur, and recreational counterparts.

Regarding differences in competitive levels, outfield players (forwards, midfielders, and defenders) demonstrated higher VO2max, average anaerobic power, RSA, and sprint performance (5 to 20 m), along with lower adipose tissue proportion and superior explosive lower limb capacities (countermovement jump (CMJ) and squat leap (SJ)) compared to goalkeepers, starting as young as 8 years old. Furthermore, physical performance generally shows significant improvement with age.

These results, along with the diverse physiological profiles across various positions, age groups, and competitive levels among male soccer athletes, suggest that training regimens should be tailored for individual positions, skill levels, and age group, akin to the current training methods used for goalkeepers.

3.6 Study by Loturco et al., (2018)**:**

Entitled "Acceleration and Speed Performance of Brazilian Soccer Players Across Various Age Groups," this study aimed to compare vertical jump performance (squat jump [SJ] and countermovement jump [CMJ]), relative mean propulsive power in the squat jump (MPP-REL JS), and

acceleration and speed (0-5, 5-10, and 10-20 meters) among players from the same professional club, divided into age categories (U15 [n = 20], U17 [n = 53], U20 [n = 22], and seniors [n = 25]). The tests were conducted indoors at the beginning of the preseason.

A magnitude-based inference approach and standardized differences (effect sizes) were employed to compare the different age categories. SJ, CMJ, and MPP-REL JS showed an increase with age, peaking at the U20 category, where they were similar to senior players. Interestingly, 0–5-meter acceleration was likely greater in U15 players compared to U17 and senior players. Although soccer players improve their unloaded and loaded jumping abilities as they mature, the same progression is not seen in acceleration ability from the early stages of development (under 15 years).

Strength and conditioning coaches should devise effective strategies to improve weaknesses in maximal acceleration performance for elite soccer players in their training programs.

4. Commentary on Similar and Related Studies:

From the previously mentioned studies, several points have been extracted that support the research topic, as they addressed chronological age and its relationship with physical attributes, along with various other variables, as follows

4.1 Subject:

The similar and related studies partially shared one of research topic variables, such as age group and physical attributes, including strength, speed, and endurance. They differed in temporal and spatial contexts.

4.2 Objective:

The reviewed studies covered various topics from different angles, all focusing on the impact of age, anthropometric characteristics, and physiological attributes on performance and physical attributes. They also highlighted the relationship among composite attributes, chronological age, biological maturity, and training experience, aligning with the objectives of our study.

4.2.1 Study Methodology:

4.2.2 Study Method:

The similar and related studies employed both descriptive and experimental methods.

4.2.3 Temporal Scope:

The studies were conducted during 2010 and 2023, while the research topic was conducted during 2023 and 2024.

4.2.4 Study Sample:

The study samples varied based on the nature and objectives of each study, including professional and amateur football players, male and female, different age groups, as well as rugby players and sprinters. Most studies used purposive sampling.

5. Methodological Procedures Followed in the Study:

5.1 Method Used:

- the descriptive method was adopted، using two sets of10 players each, subjected to some physical tests, considering it suitable for the nature of the problem and the study.

5.2 Study Population and Sample:

5.2.1 Study Population:

- The study population consisted of all soccer athletes in the honorary division of the Biskra Provincial League for the following age categories: under 17 years and under 19 years. The under 17 years category included 238 players, and the under 19 years category included 242 players, making a total of 480 players distributed across 28 teams, representing the available population.

5.2.2 Study Sample:

- The sample for the research was selected intentionally and consisted of the football team of Shabab Tolga City, belonging to the provincial division of the Biskra League, group A1. We selected 10 players from each age group, making the total sample 20 individuals, with the condition of regular attendance and no absences during the physical preparation period.

5.3 Study Variables:

5.3.1 Independent Variable:

- The factor that the researcher wants to measure its impact on the studied phenomenon, which in this case is the age group.

5.3.2 Dependent Variable:

- The factor influenced by the independent variable, which manifests as a result of its impact, referring to the physical attributes.

5.4 Study Scope:

5.4.1 Spatial Scope:

- The field study was conducted at the First of November Stadium in the Tolga district, where the Shabab Tolga team trains and plays. The location was chosen due to its suitable conditions for conducting field tests, including an athletics track, artificial grass field, and changing rooms.

5.4.2 Temporal Scope:

- The study commenced on August 15th, 2023, following approval from the club management and stadium administration to attend the early-season training sessions. The preliminary study began on August 20th, 2023, involving measurements of weight, height, age, leg length, and pelvis height to ensure the knee angle was 90 degrees. These measurements were recorded and input into the My Jump and My Sprint programs. Players were informed and briefed on all test procedures (strength, speed, endurance) through videos and live demonstrations. Physical tests were conducted on August 21st, 2023. The tests were repeated a week later under identical conditions to evaluate the consistency of the assessments. By the conclusion of the physical preparation period, an endurance test was conducted on September 30th, 2023, with players in good health and having not participated in any high-intensity training for 48 hours prior. The following day, strength and speed tests were conducted. The process of analyzing and discussing the results began on October 2nd, 2023.

Fig.1. Method of Measuring Height at 90º Angle



Source: My Jump 2 app

Fig.2. Measuring Leg Length



Source: My Jump 2 app

5.5 Study Tools:

5.5.1 Physical Tests:

A. 20-Meter Speed Test using My Sprint App:

- **Objective:** Measure reaction speed (response time).
- **Equipment Used:** Whistle, plastic cones, measuring tape, iPhone 7s, "My Sprint" app installed on iPhone, phone holder.

Warm-up Procedure for the Speed Test:

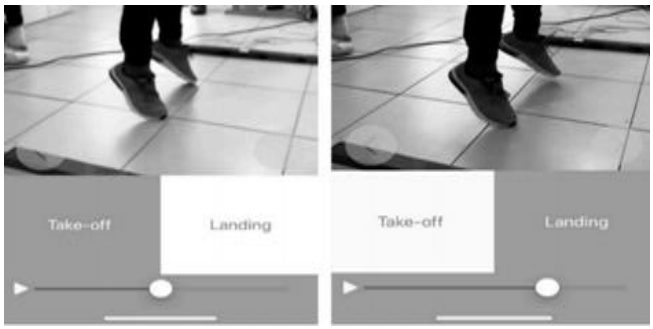
- Run for 10 to 12 minutes with a gradual increase in running pace in the last 3-4 minutes.
- Perform active dynamic stretches.
- **Perform different speed runs:** twice at 30 meters with 80% intensity, three times at 20 meters with 90% intensity, and four times at 10 meters with maximum speed (Lesserteur, 2009, p. 118).
- After preparing the running track and setting up the cones, start recording the video at 240 frames per second using an iPhone 7s and save it. Each player performs three attempts, and the best attempt is selected.
- The start of the run is determined by the player's first movement, identified through visual inspection using the My Sprint app.
- The study by Romero-Franco, et al., (2016) confirmed the validity of the app used and the accuracy of its results**.**

B. Strength Test: Vertical Jump (SJ) using My Jump 2 App:

- **Objective:** Measure the strength of the lower limbs.
- **Equipment Used:** iPhone 7s, "My Jump 2" app installed on iPhone, phone holder.

- Three vertical jump attempts were performed to the highest possible level with a 2-minute rest among each attempt. The best jump was recorded using an iPhone 7s with the My Jump 2 app, which calculates the leap height by hand identifying the takeoff and touchdown frames, as shown in the following figure:

Fig.3. Measuring Leg Length



Source : (Bogataj, et al., 2020, p. 4) .

- The application calculates the leap height using the formula h=t2×1.22625h = t^2 \times 1.22625h=t2×1.22625 described by Bosco et al., (1983), where h represents the jump height in meters and t represents the flight time in seconds.
- The study by Bogataj, et al., (2020) confirmed the validity of the app used.

C. Endurance Test: 5-Minute Test (Brikci and Dekkar) (Lesserteur, 2009, pp. 202-207)

- Objective: Measure maximal aerobic speed.
- Equipment Used: Cones, decameter, stopwatch, whistle, results recording sheet, 200m or 400m track marked every 10 meters.
- Test Procedure: Warm-up by running at moderate intensity for 20 minutes, then divide the groups. Upon hearing the whistle, the player runs to cover the maximum distance possible within 5 minutes, without alternating among walking and running.
- After the tests, the results for each player are recorded and documented.

5.5.2 Psychometric Properties of Physical Tests:

5.5.3 Reliability:

To calculate the reliability coefficient, we used the test-retest method on August 21st, 2320, and August 28th, 2320, on a sample of 08 players (initial study group), which was omitted from the primary study group. The reliability coefficient was calculated using Pearson's correlation coefficient.

5.5.4 Validity:

To establish the intrinsic validity of the physical tests used, we calculated the square root of the reliability coefficient. Table (01) shows the results of the psychometric properties of the tests applied to the pilot study sample:

Table 1. Psychometric Properties of Physical Tests

Tests	Tests			Retest			Stability	Self-Validity
	Mean	SD	Sh.P	Mean	SD	Sh.P		
Speed	2.34	0.18	0.47*	2.33	0.17	0.44*	0.99*	0.99*
Strength	28.19	5.66	0.37*	28.42	5.59	0.40*	0.99*	0.99*
Endurance	15.60	1.01	0.56*	15.68	1.03	0.90*	0.98*	0.99*

SD= Standard Deviation, **Sh.P =** Shapiro Probability

Source: Prepared by researchers using the spss 22 program

Based on Table (01), we observe that the dependability and intrinsic validity coefficients of the assessments employed in the research are high, with the former ranging among 0.99 and 0.99, and the intrinsic validity being 0.99 for each. This indicates the reliability and validity of the tests applied to the study sample.

5.5.5 Statistical Tools:

- Arithmetic mean.
- Standard deviation.
- T-test for independent samples.
- Pearson's simple correlation coefficient.

6. Presentation, Analysis, and Discussion of Study Results:

6.1 Verification of the First Sub-Hypothesis:

There exist statistically notable variations in the speed assessment outcomes between the under 17 and under 19 age groups by the end of the physical preparation period for soccer players.

Table 2. Results of Speed Test Differences between Under 17 and Under 19 Age Groups By the end of the preparation Period

Under 17 years	Under 19 years	Calculated T	T Probability	Statistical Sig

Mean	SD	Sh.P	Mean	SD	Sh.P	1.09	0.29*	There exist statistically significant differences
2.27	0.09	0.11*	2.22	0.10	0.53*			

***** = Sig at a 0.05 error rate, **SD=** Standard Deviation, **Sh. P** = Shapiro Probability, **Sig** = significant

Source: Prepared by researchers using the spss 22 program

From Table (02), we observe that the mean value for the speed attribute of soccer athletes under 17 years old is 2.27 with a standard deviation of 0.09, which is higher than the mean value for soccer athletes under 19 years old, which is 2.22 with a standard deviation of 0.10. We also note that the Shapiro-Wilk probability for the speed measurements of soccer athletes under 17 and under 19 years old is 0.11 and 0.53, correspondingly, which are greater than the error rate of 0.05. This indicates that the data is normally distributed.

The probability of the T-test (sig) among soccer athletes under 17 and under 19 years old for the speed attribute is 0.29, which is greater than the error rate of 0.05, indicating that there exist no statistically notable disparities among soccer athletes under 17 and under 19 years old in the speed attribute. In other words, there exist no statistically notable variations in the speed assessment outcomes among the under 17 and under 19 age groups by the conclusion of the preparation timeframe for soccer players.

6.2 Verification of the Second Sub-Hypothesis:

There exist statistically notable variations in the strength assessment outcomes between the under 17 and under 19 age groups by the end of the physical preparation period for soccer players.

Table 3. Results of Strength Test Differences between Under 17 and Under 19 Age Groups By the end of the Preparation Period

Under 17 years			Under 19 years			Calculated T	T Probability	Statistical Sig
Mean	SD	Sh. P	Mean	SD	Sh. P	3.88	0.01*	There exist statistically significant differences
28.45	3.78	0.15*	35.20	4.21	0.66*			

SD= Standard Deviation, **Sh. P** = Shapiro Probability, **Sig** = significant

Source: Prepared by researchers using the spss 22 program

From Table (03), we observe that the mean value for the strength attribute of soccer athletes under 17 years old is 28.45 with a standard deviation of 3.78, which is lower than the mean value for soccer athletes under 19 years old, which is 35.20 with a standard deviation of 4.21. We also note that the Shapiro-

Wilk probability for the strength measurements of soccer athletes under 17 and under 19 years old is 0.15 and 0.66, correspondingly, which are greater than the error rate of 0.05. This indicates that the data is normally distributed.

The probability of the T-test (sig) among soccer athletes under 17 and under 19 years old for the strength attribute is 0.01, which is less than the error rate of 0.05. This suggests that there exist statistically notable disparities among soccer athletes under 17 and under 19 years old in the strength attribute, favoring the under 19 players as their mean value is higher. In other words, there exist statistically notable variations in the strength assessment outcomes among the under 17 and under 19 age groups by the conclusion of the preparation timeframe for soccer players.

6.3 Verification of the Third Sub-Hypothesis:

There exist statistically notable variations in the endurance assessment outcomes between the under 17 and under 19 age groups by the conclusion of the physical preparation end for soccer players.

Table 4. Results of Endurance Test Differences among Under 17 and Under 19 Age Groups By the end of the preparation Period

Under 17 years			Under 19 years			Calculated T	T Probability	Statistical Sig
Mean	SD	Sh. P	Mean	SD	Sh. P	2.20	0.04*	There exist statistically significant differences
16.10	1.13	0.95*	16.98	5.78	0.42*			

SD= Standard Deviation, **Sh. P =** Shapiro Probability, **Sig =** significant

Source: Prepared by researchers using the spss 22 program

From Table (04), we observe that the mean value for the endurance attribute of soccer athletes under 17 years old is 16.10 with a standard deviation of 1.13, which is lower than the mean value for soccer athletes under 19 years old, which is 16.98 with a standard deviation of 5.78. We also note that the Shapiro-Wilk probability for the endurance measurements of soccer athletes under 17 and under 19 years old is 0.95 and 0.42, correspondingly, which are greater than the error rate of 0.05. This indicates that the data is normally distributed.

The probability of the T-test (sig) among soccer athletes under 17 and under 19 years old for the endurance attribute is 0.04, which is less than the error rate of 0.05. This suggests that there exist statistically notable disparities among soccer athletes under 17 and under 19 years old in the endurance attribute, favoring the under 19 players as their mean value is higher. In other

words, there exist statistically notable variations in the endurance assessment outcomes among the under 17 and under 19 age groups by the conclusion of the preparation timeframe for soccer players.

6.4 Interpretation of Study Results:

The main findings of the study are:

- There exist no statistically notable variations in the speed assessment outcomes between the under 17 and under 19 age groups by the end of the preparation period for soccer players.
- There exist statistically notable variations in the strength assessment outcomes between the under 17 and under 19 age groups by the end of the preparation period for soccer players.
- There exist statistically notable variations in the endurance assessment outcomes between the under 17 and under 19 age groups by the end of the preparation period for soccer players.

6.5 Discussion of Study Results:

Based on the results presented earlier**:**

- Referring to Table (02) and Figure (02), we reject the direct hypothesis stating, "There exist statistically notable variations in the speed assessment outcomes between the under 17 and under 19 age groups by the end of the preparation period for soccer players," and accept the null hypothesis, indicating that there exist no statistically notable variations in the speed test results. This finding is statistically valid.

Despite both groups undergoing the same general and specific preparation period, this finding is consistent with some studies we reviewed, such as:

- The study by Nikolaidis et al., (2016), which demonstrated that the speed capability of soccer athletes improved with age until reaching its peak at age 15. Beyond this, other age categories from under 16 to under 35 showed no notable disparities in speed during a 20-meter sprint.
- Referring to Table (03) and Figure (03), we accept the direct hypothesis stating, "There exist statistically notable variations in the strength assessment outcomes between the under 17 and under 19 age groups by the znd of the preparation period for soccer players." This finding is statistically valid.
- The study by (Loturco, et al., 2018), which found that the ability for vertical jumping (squat jump and countermovement jump) increased

across age categories up to under 20 years, with this category being similar to senior players.

- The study by (Guerioune, 2010).

The results found that the students' assessment outcomes were significantly lower compared to senior players, indicating the importance of the athlete's age and its impact on enzymatic activity in the anaerobic sector (Fournier et al., 1992).

- The study by (Manson et al., 2014) concluded that for leg strength, the older age group had significantly greater strength compared to younger athletes.
- Referring to Table (04) and Figure (04), we accept the direct hypothesis stating, "There exist statistically notable variations in the endurance assessment outcomes between the under 17 and under 19 age groups by the end of the preparation period for soccer players." This finding is statistically valid.
- The study by (Slimani & Nikolaidis, 2017) showed that VO2max showed a significant increase with age (between 11 and 17 years).
- After analyzing our study results and comparing them with related or similar studies, we confirm the main hypothesis that there is an age group effect on the results of some physical attribute tests by the conclusion of the preparation timeframe for soccer players, as confirmed by:
- The study by (Slimani & Nikolaidis, 2017), which found that age-related performance increased significantly with age.
- The study by Ciorsac et al., (2010), which indicated a notable impact ($p<0.05$) of age and competitive level on leg muscle strength, velocity, agility, and peak aerobic capacity. These physical fitness characteristics improve with age and competitive level. There is a strong correlation also exists between muscular fitness traits and body measurements.

7. CONCLUSION

The introduction of this research presented some theoretical approaches related to the study variables, particularly chronological age and its associated changes through growth stages. We then discussed sports training and physical attributes, leading to the nature and requirements of modern football activities. The main question posed was:

Is there an effect of age group on the results of some physical attribute tests by the conclusion of the preparation timeframe for soccer players?

After outlining the methodological steps followed in the research, including the definition of the population and the sample, as well as the data collection tools, we presented several studies deemed relevant to the topic. These studies were cited in interpreting the results obtained after their presentation. The results indicated that the age group does indeed affect the physical attributes of football players.

7.1 Key Suggestions and Recommendations:

It is advisable to consider repeating the study with a different age group sample, preferably including senior players. Additionally, the study could be conducted on female athletes to identify gender differences among athletes. Conducting the study over the entire sports season to monitor the development of players and the team is another possibility. Furthermore, it would be beneficial to study different playing positions and highlight the specific requirements for each position.

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