

Physical performance profile of Algerian reserve soccer Teams (U21)

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Received: 30/01/2025 Accepted: 08/03/2025 Published: 30/05/2025

Abstract:

Through this study, we enlightening an important soccer aspect related to ultimate youth development process (Under 21) by defining their profile and compare this profile to different others from different studies. Data from 23 elite soccer players were collected and analyzed after undergoing physical performance tests (Sprint - Standing Broad Jump -Balance – Agility- Flexibility) in addition to the measure of the Weight and Height. In general, anthropometrics characteristics of Algerian soccer players U21 are below than those reported in the literature, regarding the quality of sprint, Algerian seem slower than their peers from other countries. In term of other physical performance, we just added our Algerian value to the little results reported in literature, finally most results are quite similar to the below category (U19).

KEY WORDS: Anthropometry - Reserve team - Balance – Agility - Flexibility.

الملخص:

جزء هذه الدراسة، قمنا بتسليط الضوء على جانب مهم من جوانب كرة القدم يتعلق بعملية التكوين والخاص بفئة (تحت 21 عامًا) أو ما يسمى بالريفي من خلال تحديد نمطهم ومميزاتهم ومقارنة هذا النمط الشخصي بأنماط أخرى من دراسات مختلفة. تم جمع البيانات من لدن 23 لاعب كرة قدم من النخبة وتحليلها بعد الخضوع لاختبارات الأداء البدني (الجري السريع - القفز الطويل من وضع الوقوف - التوازن - التناسق - المرونة) بالإضافة إلى قياس الوزن والطول. بشكل عام، فإن خصائص القياسات الانثروبومترية للاعبين كرة القدم الجزائريين تحت 21 عامًا أقل من تلك المذكورة في مختلف الدراسات البيبليوغرافية، فيما يتعلق بجودة الجري السريع، يبدو الجزائريون أبطأ من أقرانهم من البلدان الأخرى. من حيث الأداء البدني، أضفنا قيمتنا الجزائرية إلى النتائج الصغيرة المذكورة في مختلف الدراسات، وأخيرًا فإن معظم النتائج متشابهة تمامًا مع الفئة أدناه (تحت 19 عامًا).

الكلمات المفتاحية: الانثروبومتري - الفريق الريفي - التوازن - التناسق - المرونة

1-Introduction:

Soccer or football considered as complex sport is characterized by a bunch of factors including high level of: tactical, technical and physical characteristics, all together play a vital role in the performance of soccer (Bradley and Ade, 2018; Wilson and coll., 2005), the rhythm and pace of soccer development is going faster and faster continually with great impact of the physical aspect (Mohr et al., 2022; Casamichana and al., 2019). Playing at elite level, requires potential of physical fitness (Krustrup and al., 2005; Manson and al., 2014).

Always soccer teams seek to attain success, therefore, factors such as physical and physiological aspects, being motivated, in addition to mastering the details of activity are mandatory to achieve (Morris, 2000; Williams et Reilly, 2000), Notice that anthropometric and physiological characteristics (Sutton et coll., 2009) and overall physical performance is an important component of soccer match performance as reported in the literature, that why, within the world of soccer literature, a lots of attention was paid to the importance of physical factors and its relation to success in soccer (Deprez et coll., 2013; Aksoy and Baydemir, 2019).

As we mentioned earlier, soccer rhythm and pace as well as number of games in a season keep increasing, the physical impact onto the players is having large place in soccer (Bangsbo, 2014; Cometti et coll., 2001). Soccer game alike other sports is affected by plethora aspects (competition formula - area of play and of course players themselves). These different properties make it unique and outstanding either physiologically and physically comparing to others sports discipline (Göksu et Yüksek, 2018).

Getting data from soccer game is becoming accurate, practitioners identify the needs in physical and physiological aspect by observation and analysis, therefore, based on the data collected, soccer players can be trained depends on their needs. Overall, in soccer, elite players can cover up to 10 to 12 km of distance on average in ninety minutes of game with a large variety of moves and actions, in order to be successful speed, endurance, power, agility as well as coordination are

mandatory to possess. In addition, sudden moves (accelerations, decelerations) as well as complex skills and jumps necessitating balance have to be present within soccer players (Göksu and Yükses, 2018). Some details, like the sprint during soccer game can make difference between teams, the action of sprint is approximatively five percent of the match duration (Bloomfield et coll., 2007) and goes up to 30 meters for each (Di Salvo et coll., 2007), noting that most efforts of the sprint are not made in a straight line.

Naturally, during a soccer game, players are engaged in a multitude of movements (non-cyclic) varying in intensities, thus, coaches need to be aware of methodology of training and should direct their training to develop all physical performance's facets (Boraczyn'ski et coll., 2022). It's common sense that soccer is predominantly aerobic energy source combined with frequent, brief, intense intermittent actions associated with high rate of anaerobic energy (Boone et coll., 2012). Resulting in the need to improve soccer players fitness level using exercises to make them excel in competition (Dragijsky et coll., 2017). It's important to mention the individual physical activity profile for each player during matches as database for further wise training load (Stevens et coll., 2017).

The talent identification process in soccer is crucial in modern soccer and teams deploy all resources to take benefit, within this process, evaluation of physical profile is part of it, allowing practitioners applying field tests for a lot of players gaining time (Hulse et al., 2013). Current evaluation is anthropometric characteristics (Leão et al., 2019) as well as body composition affecting the specific profile of football players and their performance (Mala et coll., 2018).

Mentioning soccer's characteristics related to anthropometric and motor can guaranty the access to players level of training in one part and the other part, targeting players who might show limited specific qualities that are very essential for the success outcome of their game, leading to set norms for developing best future talent (Datson and coll., 2014; Ingebrigtsen and coll., 2011). Specifically, and referring to Sutton and coll. (2009) and Bourdon and coll. (2017) in their studies, they respectively show that the body composition and/or physical

fitness around the season are considered to be a key element to elaborate a well-structured development of performance and mitigation's injuries strategy.

Creating profile for each soccer players has to go through making anthropometric and physiological datas by using a battery of tests referring to critical norms in order to be more accurate when targeting future talents, it is true that the process of young players development in soccer is determined by countless factors, and not limited to anthropometric, physiological, tactical, technical, psychological, in addition to environmental and sociological impact (Unnithan et coll., 2012 ; Larkin and O'Connor, 2017).

Participating in youth international soccer events is interesting both for players and teams, the best performance is usually considered as the fruit and outcome of talent development system for each academy's around the world, stronger than that, it is probably the key element of future international success at the senior level, however, that not always the case (Johnston and coll., 2018). Most teams has the U21 category as the last transition step to senior level and this can be the most significant barometer of later careers among the whole process of youth development (Herrebrøden and Bjørndal, 2022). Consequently, it is important the comprehension of the profile of best players, and make sure that they are given and utilized in proper position and are attributed to the best role during the game (Chaouachi and coll., 2009), this can be achieved with adequate observation and analysis within soccer talent program development (Reilly, 2005).

All those physical attributes that can define soccer's success performance find their role in the evaluation procedure (Soós and coll., 2022), therefore, the evaluation process of physical profile within talent identification and development become more than simple task (Göksu and Yükses, 2018), for example, professional academies in England, running physical test is part of the whole academy politic at least three (03) sessions each year for different age categories even U21. The evaluation process as known in different academies around the globe, leads to building a big data in favor of practitioners to

promote success of their designing training and the development of the players (Saward et coll., 2020).

It's well known that soccer players belonging to the U21 level are in their last step of development in the process of youth academy and are worry about their future into the world of soccer professional (Filho and Butterworth, 2020), this category as we mentioned has been found to be a linked to future career attainment in senior level (Schroepf and Lames, 2018).

A special attention has to be paid to this category, so while some information is available about the physical and physiological demands of young Algerian soccer and adults' players, to our knowledge very little information is available in term of studies related to our group study, mostly paid attention to population youth until U19 (Bounekar, 2023).

Moreover, these characteristics have not been well explored in the sphere of competitive soccer system in Algeria, we believe there is some scarcity of data related to anthropometric and physical performance characteristics of Algerian soccer players belonging to U21 category. However, in the domain of physical aspect, it's also remains unknown how elite Algerian footballers will be when compared with previously reported data of physical results of professional footballers from different countries. Enlightening these results may probably lead to build basis for our training programs curriculum which over time would stand out the standard and references of Algerian football.

Although, the importance and place of physical and anthropometrical characteristics in soccer performance was previously admit, as far as we know, these parameters were not well-considered in the category of U21, that why our objective through this research is to determine the physical characteristics of elite soccer football players (U21) in Algeria by using physical tests from batterie called EUROFIT, in addition to measure the speed quality as well as anthropometrics characteristics, our results will be compared to other data collected from different countries and studies found in the literature.

When it's come to specific physical profile requirement and anthropometrical characteristics, There is some proofs saying that they are associated with success in football; Therefore, we really suggest and affirm that physical normative data in Algerian players under 21 are vital to determine, in order to bridge the gap toward the senior level, we think also that our study will help to enrich the Algerian data related to this category, the data collected will be positioned among others to have precise view of our national soccer curriculum comparing to what around us, we suggest that our study can establish a solid physical profile for this category of U21, also we think this is can guide coaches and athletes through high training program and increase our Algerian playing standard .

2- General objective of the study:

As the ultimate aim is to set up a solid physical profile for this category of U21 through specific objectives:

- Find anthropometrics characteristics (weight and height).
- Find physical performances (Speed – Power – flexibility- Agility – Balance).
- Differentiate our profile with others profiles from national and international studies.

3- Procedural definition of the concepts mentioned in the research:

-Reserve team: is a team that incorporates players engaged in contract to a club but who do not usually play in competitions for the first team (wikipedia).

-Anthropometry: furnishes a low-cost, and easy method of body composition (Kuriyan, 2018).

-Balance: Postural balance is not well-known element in the physical development of athlete through literature. However, balance has an effect as variable factor on performance, especially in specific competency and injury prevention related to activity (Jadczak, and coll., 2019). Balance is guaranty through a multiplex process including sensory detection of body motion (Bok et al., 2013).

Agility: explained primarily by Clarke. (1959) cited by Haugen and coll. (2013) as rapid moving body position or changing of direction. Moreover, agility may incorporate switching direction of the whole body under different angles, additionally slowing down to sudden stopping as response to a stimulus (Young et al., 2022; Sheppard and Young, 2006).

Flexibility: is the capacity of a muscle to increase its length and permit joints, either one or more to move through a range of movement (Corbin and Noble, 1980; Leggins, 2010).

4- The methodological procedures used in the study:

4.1 Method and tools

Following Algerian Soccer Federation regulation, we got to select our players belonging to under 21 elite teams. The evaluation was conducted during spring 2019 over the soccer competitive season, the clubs have generally four up to five practices during a week, in addition to one (01) match weekly, a well warm up was conducted for readiness, favorable conditions were present for the test's success.

Subject:

We gathered a number of players equal to 23 from the category Under 21 belong to elite soccer teams (competitive division) as stated by Algerian Soccer federation (FAF). Our players came from three (03) teams:

-Union sportive Madinat el djazair - Mouloudia Club Alger – Nasr hussein dey. The number of practices per week varied in relation to game frequency, in general four to five sessions.

Theoretical Study

A lot of articles were in the menu related to our topic using search engine like pub-med.

Anthropometrics evaluation

We limited our measurement to the stature and body weight of each soccer player.

Physical battery tests

Also, we proceeded to test the five (05) physical performances, most of them taken from EUROFIT battery test (most common test battery especially in Europe) as follow:

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-Speed using the test of 30 meter: This test consists of running a distance of 30 meters as quickly as possible.

- Standing Broad Jump (SBJ): Player has to have his feet about shoulder-width apart, he had to jump forward as far as possible, landing on both feet without falling backwards, through that we aim to have idea about explosivity (power).

-Agility: at the beginning and right behind the line, we instruct the player to maximally run a distance of 5 meters back and forth. This movement is a cycle and is repeated five (05) times.

-Flexibility: by using a test called sit and reach test: its allows to evaluate flexibility (Berisha, and Cilli, 2017), targeting lower back muscles and hamstring too.

-Balance: the posture balance was evaluated through a single leg flamingo balance test, it is used to determine the general body balance (Berisha, and Cilli, 2017), with the objective to collect how many falls within a minute the subject has (Akyüz, 2018).

Statistical tools

Our main statistical tool to go through the results was the popular Software called SPSS. We used the Mean as one parameter to measure the central tendency, also the average and standard deviation values to measure the variability. Finally, the T test student for comparison.

4-2 Presentation and Analysis of Results:

Table N°1. **Player's different Physical aspects**

Global Physical profil aspects						
Weight	Height	Sprint	Long jump	Agility	Flexibility	Balance
65.08±14.54	1.75±0.07	4.33±0.12	2.31±0.14	17.14±0.76	25.4 ±8.14	5.84 ±3.13

Data are mean ± SD.

Source: **Hakim Bounekar**

4-3 Discussion and interpretation of the results:

Through this study, we could have a total of number equal to twenty-three (23) male soccer players who played in professional U21 team and took part voluntarily in the present study, players from all team positions were represented at the exception of goalkeepers, the

goalkeepers as most study are excluded were withdrawn because of their special activity profile compared to other roles in soccer (White et coll., 2018). In this context, our present study was conducted as a main objective to analyze their physical profile. Based on table N1, our data, in this case, the weight is 65.08 ± 14.54 , while the Height is 1.75 ± 0.07 .

Those two main characteristics, in this case, the height and weight are factors that might affect some performance of soccer players, specifically in term of sprint and jump as well as endurance capacity (Ben brahim and coll., 2013). With respect to anthropometric values, in our study, we revealed surprisingly that there is no increase in the stature and body mass with advancing age when it's compared respectively with U19 Algerian youth soccer players 68.1 ± 0.9 and 1.76 ± 0.00 (Bounekar, 2023), definitely we came to the same data found in professional Swiss soccer players, where the swiss U21 have similar height and weight values as their U19 (Ammann and coll., 2023), that why, we might conclude that those two anthropometrics parameters (weight and height) -at least in our study- soccer players may attain their growth before the age of 20 and do not show increase when going up in age.

When we compare our results with previously reported anthropometrical results of others players, for example, the study of Kourdes and coll. (2022) are in line with ours, their study made on one Algerian U21 soccer team (USMA) shows that the average weight 64.37 ± 4.39 and the Height 176.0 ± 6.27 , This is consolidating and define strongly the Algerian profile.

Always in same idea, our results also are in line with the ones revealed by Nikolaidis and Karydis (2011) where their study showed that weight and height were respectively 75.21 ± 6.4 and 1.779 ± 0.072 . Other than that, in another study, where the player's positions are taken in account, anthropometrics' Turkish players values were as follow: defensive players 179.188 ± 3.63 ; midfielders 181.048 ± 4.79 ; offensive players 181.565 ± 3.51 and their weight were: defenders 70.93 ± 3.12 ; midfield players 71.57 ± 3.99 ; attackers 71.39 ± 3.35 (Aksoy and Baydemir, 2019), comparing to our results, Turkish

players seem to be taller and heavier than the values of our Algerian players.

Same observations were found in Spain, where the weight and height of U21 amateur soccer players were respectively: 75.5 ± 7.7 kg, 1.79 ± 0.10 m (Segovia et coll., 2011), clearly, we can observe that Spanish players are heavier than our players, and little over than normal, we can assume this to may be due to excessive body fat in amateur level comparing to elite.

These differences are consolidating in another data that came from Swaziland (Ammann and coll., 2023), where the values of U21 professional players were as follow: stature 1.82 ± 0.04 m and body mass: 76.39 ± 6.00 kg, it can be seen from its results that players from Swiss are heavier and taller than our Algerian players. In their side, Hoppe and coll. (2020) show that German professional U21 soccer players are taller 1.80 ± 0.02 and heavier 77.7 ± 1.7 than our Algerian players.

From above results, we can attribute the difference in height and weight between Algerian and some players from other countries especially in Europe, in relation to the difference in general population between Algerian and other countries, this is confirmed by a recent study comparing the anthropometric characteristics of high-level players, where Halvorsen Wik and coll. (2019) reported that the stature (height) of a player playing in the Qatari championship was almost similar to that reported among professional players from the United Arab Emirates (175.1 cm), from Kuwait (172.7 to 173.4 cm), Saudi Arabia (177.2 cm) and from Bahrain (172.0 cm) while comparing them, the same authors confirm that this Height displays shorter values compared to players from first division in Belgium (178.4 cm), England (181.0 cm) in Spain (180.6 cm) in Norway (182.9 cm) in Iceland (181.0 cm) in Serbia (181.8 cm) and in Poland (181.0 cm). In Addition to the stature, a similar observation of results was made for body mass in these respective league comparisons.

As stated in literature, to be successful, strength and power are essential for soccer players, these qualities are linked to more muscle mass (Bekris and coll., 2016 ; Bjelica and coll., 2020). When it comes

to physical performances, the table N 1 shows that our study revealed the following results for our players: Sprint 4.33 ± 0.12 – Long jump 2.31 ± 0.14 - Agility 17.14 ± 0.76 – Flexibility 25.4 ± 8.14 and Balance 5.82 ± 3.13 .

Our results surprisingly tend to be similar to the results found in the youth Algerian U 19 category, whereas in the study made by Bounekar. (2023) revealed in elite U19 group the following results : Agility 17.34 ± 0.09 - Sprint 4.25 ± 0.01 – Flexibility 26.02 ± 1.00 - Long Jump 2.28 ± 0.02 then Balance 6.78 ± 0.65 , through this observations, we can conclude that physical performances tend to be similar between U19 and U21, and some players might achieve their development before the age of 20, as mentioned by Baumgart and coll. (2018) where they announced that sprint performance of youth soccer players increases throughout of time maturation or until players they turn the age of seventeen (17 years).

We notice some discrepancy of sprint's result between our study and the study of Kourdes and coll. (2022), in this last study, researchers found the values of sprint 4.59 sec. we assume that, the number of samples can be a one factor that leads to this difference between ours and theirs, as both studies were made here in Algeria with the same level of competition, probably in future we might expand our sample to have precise ideas.

Aslan and Koc. (2015) in their study made in Turkish amateur players, they found that the value of 30-meter sprint was 4.30 ± 0.18 sec, which seems similar to our results, parallel, in Spain, Segovia and coll. (2011) revealed within soccer amateur players, that the value of time at 30 meter was 4.43 ± 0.14 s, we could attribute this according to literature to the level of division play (Bounekar, 2023).

Not surprisingly, when it comes to U21 German professional players, those players are much faster than our players displaying the value of 4.18 ± 0.048 s (Hoppe, 2005). As we mentioned above, and through a lot of literature, soccer game tends to go faster and faster over time, the quality of speed has become very principal and crucial element for successful performance in soccer (Altmann and coll., 2019), in

addition, speed quality is found to be bias element between ages group and level of play (Bounekar, 2023).

In addition to speed, It is important for soccer players to have better agility, in our study, one more time agility's results show similar values than those found in U19 elite soccer players (17.34 ± 0.09) but in general agility, shows a certain evolution among the elite youth players in particular (Bounekar, 2023), contrarily, Fiorilli and coll. (2017) find out that agility in youth can be better in youngest players comparing to older ones.

Another quality is muscle power, this quality again is considered as one of the major factors in elite soccer players development, generally speaking, greater the players have leg's power the higher they can jump (França and coll., 2021; Loturco and coll., 2019). Through our data, jump's results show again similar values than those found in U19 elite soccer players (2.28 ± 0.02) (Bounekar, 2023), this is confirmed by Bangsbo and Mohr. (2012) where they notice that muscle mass and power output increase during growth until the age of 18.

Another characteristic tested during this study is flexibility or pliability, our results (25.4 ± 8.14) one more time show similarity with U19 elite and amateur players (26.02 ± 1.00 ; 24.62 ± 1.83) respectively. Flexibility tends to be alike among all players in different age categories regardless of the difference in level of play, although, exception of some superiority among sub-elite players, however this quality is not as much as important in term of talent identification (Bounekar, 2023), this confirmed by Aslan and Koc. (2015) in their study made in Turkish amateur players where the value of flexibility was 27.81 ± 6.14 cm, which seems similar to our results.

Finally the last characteristic measured is Balance, this capacity does not follow a linearity in relation to age groups, its evolution is relatively unstable in relation to age, the same is true in our study, where there is no difference in our study with the following value (5.84 ± 3.13) comparing with U 19 sub-elite and elite players, respectively (5.64 ± 0.74 ; 6.78 ± 0.65) (Bounekar, 2023).

Conclusion:

In conclusion, our current study assessed elite U21 Algerian soccer players, we aimed actually to bridge the gap that exist between youth and senior and add data to enrich our Algerian national curriculum, However, the most notable findings from this study are that anthropometrics characteristics (height and weight) of professional U21 Algerian footballers which they are lower than those compared with international players, the same observation emerges in term of sprint ability. Due to scarcity of data from literature that matches our tests, we only added values regarding others physical performance. The findings of this study indicate that our values tend to be similar to Algerian U19 category.

Our findings suggest that national classification standards based on the anthropometric and physical performances should be improved to fall into international norms, however to become internationally competitive, Algerian players will need to modify their profiles in line with elite reported in global literature. Finally, our data could be helpful in term of guiding coaches to better understand football training.

References used in the research:

Articles :

Aksoy D and Baris Baydemir, (2019), Examination of the Physical and Motoric Characteristics of Elite Soccer Players According to Their Positions Journal of Education and Learning; Vol. 8, No. 2; ISSN 1927-5250 E-ISSN 1927-5269.

Ammann L, Altmann S, Ruf L and Sperlich B, (2023), Seasonal analysis of match load in professional soccer players: An observational cohort study of a Swiss U18, U21 and first team. Front. Physiol. 13:1023378.

Aslan, C. S., & Koç, H, (2015), Comparing Selected Physical and Motoric Characteristics of Turkish Amateur Soccer Players According to Playing Positions. CBÜ Beden Eğitimi ve Spor Bilimleri Dergisi, 10(1), 56–65.

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Bangsbo, J (2014), . Physiological demands of football. Sports Sci. Exch. (SSE), 27, 1–6.

Curiyan R, (2018), Body composition techniques. Indian J Med Res 148, pp 648-658

Nala, ; ahalka, F. & Naly, T, (2018), Bioimpedance for Analysis of Body Composition in Sports. In: Simini, F. & Bertemes-Filho, P. (Eds.). Bioimpedance in Biomedical Applications and Research. Cham, Springer; pp.243-56.

Mikulic', P, (2008), Anthropometric and physiological profiles of rowers of varying ages and ranks. Klinesiology ; 40, 80–88.

Göksu, Selami Yüksek, (2018), Determination and Comparison of Physical and Physiological Characteristics of Football Players in the U10-17 Categories Journal of Education and Training Studies Vol. 6, No. 4;

Theses:

Bounekar hakim, La Variation du Profil Physique Comme Index D'Identification du Talent Chez les Jeunes Footballeurs (2023), physical education and sport institute, Algiers 3 university

Internet websites:

WIKIPEDIA (May 2024).

<https://www.google.com/search?q=anthropometrics&oq=antropometrics&aqs=chrome.1.69i57j0i10i512l9.5838j0j15&sourceid=chrome&ie=UTF-8> (May 2024).