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## Selected anthropometric profiles of U-17 male youth soccer premier league players, Ethiopia

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### Abstract

Each soccer playing position players have unique weight, height, and age requirements. This is because of their roles they perform in each position. The purpose of this study was to describe the U17 male youth soccer players of the Ethiopian premier league clubs weight, height, and age in the league, league zones, and based on players playing positions in the 2015/16 league season. This can help as a bench mark to motivate researchers in doing searches about the players' weight, height, and age profiles of the youth trainees at grass root level during selection and player development periods. And, this is important to share experience to the respective clubs and competition department in profiling the players' weight, height, and age starting from grassroots level, as these variables has a significant effect in players' game performance.

The subjects of this study were 288 (96 defenders, 96 midfielders, and 96 attackers) who had been registered and participated in the mentioned league season. All defender, midfielder, and attacker players who had participated in the league games were considered in this study purposefully.

The height of the players was taken using Stadiometer and their weight was taken using digital balance and age was collected directly from the participants via questionnaire since their age was not recorded and documented with evidence in the clubs and in the competition department of the Ethiopian football federation.

The results describe that the weight, height, and age of the U17 male youth soccer players of the players in the league as whole, league zones and based on the players playing positions in the league season. The mean weight of the players in the league was,  $M=61.60\pm 1.69$ . The mean height of the players was,  $M=1.71\pm 0.01$  and the mean age of the players,  $M=16.93\pm 0.36$ . As the standard deviation of the scores of the players weight, height, and age indicates; their weight, height, and age was close each other. Defenders, midfielders, and attackers mean weight was,  $M=61.60\pm 1.69$ ,  $M=61.34\pm 1.77$ ,  $M=59.40\pm 2.47$  respectively. Defender, midfielder, and attacker players mean height was,  $M=1.71\pm 0.015$ ,  $M=1.71\pm 0.01$ ,  $M=1.70\pm 0.021$  correspondingly and their mean age was also,  $M=16.93\pm 0.36$ ,  $M=16.84\pm 0.35$ ,  $M=17.01\pm 0.42$  individually in the league season.

The study shows that weight, height, and also age of the defenders, midfielders, and attackers looks that more or less similar weight and height in the tournament season. However, as many scholars agreed, players' assignment to soccer positions as defender, midfielder, and attacker should consider players weight, height, and age aspects in addition to their technical, physical, tactical, and psychological performances demand each soccer.

**Keywords:** soccer; anthropometric profiles; height; weight; age; playing positions.

### 1. Introduction

<sup>[1]</sup> Soccer is the most popular and widely played sport globally. There is a growing interest for this sport in Ethiopia too. However, the Ethiopia male national team is currently ranked 124 of 206 <sup>[6]</sup>. The ranking suggests that Ethiopian playing standards need to be improved in line with four key areas of soccer coaching and player development namely physical, technical, tactical, and psychological skills.

Soccer sport is characterized by short sprints, rapid acceleration or deceleration, turning, and jumping, kicking, and tackling <sup>[2]</sup>.

<sup>[9]</sup> Soccer is one of the most popular sports worldwide and a lot of research has been conducted on various aspects of it. However, most of the relevant studies have been based on elite or professional soccer players, and there is little research about young, none elite soccer players.

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In Ethiopia, studies about the youth soccer players are still rare and the coaches, fans, and clubs also heard criticism about the age of players in any of the leagues in the country. The participants of this study were young soccer players' aged U17 according to the legislation of the league<sup>[5]</sup>.

Anthropometric characteristics /profiles of athletes include height, weight, triceps skinfold, biceps skinfold, subscapular skinfold, suprailiac skinfold, calf skinfold, sum skinfold, and others<sup>[8]</sup>.

In Ethiopia, specially, in the youth soccer competitions it is common to hear about players' age cheating. This is because of the reason that the clubs and the Ethiopian football federation do not profile properly the age of the players starting from grass root level. And it is so hard to find the players age in a documented way rather than asking the players orally. The researcher finds continuous recorded players weight, height, and age in the clubs as well as in the competition department of the Ethiopian football federation.

The anthropometrical demands of a given position in the team may not be linked directly to absolute fitness. The tactical role assigned to a player in that position is probably dictated by the physical capacity of that player. It is assumed that the game has developed to become faster, with more intensity and aggressive play than seen in the past<sup>[1]</sup>.

Team games are sports where body size, shape, body composition and level of fitness, all play an important part in providing distinct advantages for specific playing positions particularly at the highest level of performance where there is a high degree of player specialization<sup>[1]</sup>.

Among the many anthropometric characteristics of soccer players, the general anthropometric characteristic profiles; such as, weight, height, and age was selected as variables to describe the player's weight, height, and age in the league, based on selected playing positions, and league zones of the tournament in the league season.

In soccer, profiling regarding player's weight, height, and age are used alongside fitness measurements to determine player's roles in a specific position of the game. As players' anthropometric characteristics has a relationship with the playing positions<sup>[4]</sup>.

<sup>[7]</sup> Anthropometry can discriminate physical capacities and soccer skills providing a scientific rationale behind the coaches' practice of selecting young soccer players. So, coaches should give emphasis in getting players at first by having the player's anthropometric profiles before doing any selection of players.

Descriptive studies availability is not sufficient that U17 youth soccer players, thus providing a further need for documentation of players' height, weight, and age progress in a sustainable way.

The database of physique and performance qualities of the players in Ethiopia, like the other western countries, is very important to make a national team. It is a fact that in Ethiopia, there is still limited information of soccer players regarding physique and physiological profiles and performance according to the playing positions and standard in the country based on the age categories.

## 2. Purpose of the study

The purpose of the study was to describe the U17 male youth soccer players of the Ethiopian premier league clubs weight, height, and age in the league, league zones, and based on the players playing positions in league season and remind coaches in order to give emphasis for the player's weight, height, and age in assigning players to different playing position in

soccer.

## 3. Methods and Materials

Two hundred eighty-eight soccer player participants of the Ethiopian U17 male youth premier league players (96 attackers, 96 midfielders, and 96 defenders) who has been registered and participated in the league of the 2015/16 had furnished their consent to serve as subjects in the study.

The procedure and benefits of the study were explained to the participants before signing the informed consent form and starting the test.

The inclusion criteria included for the study were: subjects agreed with the purpose of the study, subjects who had registered as participant player of the U17 male youth soccer premier league. The data collection was undertaken during the period of the U17 male youth soccer clubs' tournament season which was held from January 01, 2016 to July 30, 2016 in Gregorian calendar or from December 23, 2008 to July 23, 2008 Ethiopian Calendar in Addis Ababa Stadium, Adama Abebe Bekilaa stadium and the clubs own pitch around Addis Ababa, the capital city of Ethiopia.

The height of the players was taken using HX-203 Portable Stadiometer (Jiangsu, China (Mainland)), Brand Name OEM/HIGH HOPE, Model Number HX-203, Type Medical scale, Accuracy 0.1cm, Model HX-203, as a result height range to be measured 85-210cm, Graduation 0.1cm. Subject's height was taken with bare foot and study subjects were asked to stand bare foot on horizontal surface. The counter board of Stadiometer was brought down till it touches the vertex. The height of the subjects was recorded.

Subjects weight was taken using Gold 100g digital balance (top pan scale (load cell), Model (WT)-WT1003N, Capacity(g) 0-100g, Readability (g) 0.001g, Pan Size (mm)  $\Phi$ 80mm, Display LCD (white back light), Print RS232C, Power AC/DC (6\*AA dry batteries), Unit g,oz, lb, CT, GN, pcs, %, Packing (cm) 33\*28\*15cm, G.W./N.W.(kg) 3kg/2.5kg was used. Their age was collected directly from the participants via questionnaire since their age was not recorded and documented with evidence in the clubs or in the competition department of the Ethiopian football federation. The players age was not recorded beginning from their grass root level.

Descriptive statistics, such as; mean, standard deviation, minimum, and maximum scores was used to describe the players weight, height, and age in the league, league zones, and based on the players playing positions in the league.

## 3. Results

The anthropometric profiles of the players of the U17 male youth soccer clubs of Ethiopia in the 2015/16 league season as a whole the players, based on players playing positions, and league zones have been shown in table 1, 2, and 3 respectively.

The result of this study describes that the mean, standard deviation, minimum and maximum weight, height, and age of the players in the league.

The results of this study revealed statistical significant difference ( $p < 0.005$ ) in the anthropometric profiles among the players of different playing positions.

The anthropometric profiles of the study participants of the U17 male youth soccer premier league club players as whole in the league season are described in table 1.

The minimum and maximum weight, height, and age of the players were also shown in Table 1. As a result, the minimum and maximum weight of the players in the league was 53.75

and 65.62kilograms respectively. The minimum and maximum height of the players in the league was 1.67 and 1.76meters respectively. The minimum and maximum age of the players in the league was 15.78 and 17.80 in years. As indicated in table2, the anthropometric profiles of the study participants of the U17 male youth soccer premier league players of Ethiopia in the league season of 2015/16 based on players playing position. And the defender players mean weight, height and age was, M= 61.60 kilo grams with

SD=1.69, 1.71 meters with SD=0.01, and 16.93 years with SD= 0.36 respectively. The midfielder players mean weight, height, and age was M= 61.34kilograms with SD=1.77, 1.71 meters with SD= 0.01, and 16.8414 years with SD=0.35 respectively. Regarding the attacker players, the mean weight, height, and age in the league was, M=59.40 kilograms with SD=2.47, 1.70meters with SD=0.02, and 17.01 years old with SD=0.42 respectively in the league.

**Table 1:** Descriptive statistics of players’ anthropometric profiles in the league as a whole

| Descriptive statistics |         | Players Weight in Kilograms | Players Height in meters | Players Age in Years |
|------------------------|---------|-----------------------------|--------------------------|----------------------|
| N                      | Valid   | 288                         | 288                      | 288                  |
|                        | Missing | 0                           | 0                        | 0                    |
| Mean                   |         | 60.7840                     | 1.7131                   | 16.9296              |
| Median                 |         | 61.0000                     | 1.7129                   | 17.0000              |
| Mode                   |         | 61.00                       | 1.70                     | 17.00                |
| Std. Deviation         |         | 2.23267                     | .01831                   | .38977               |
| Variance               |         | 4.985                       | .000                     | .152                 |
| Range                  |         | 11.87                       | .09                      | 2.02                 |
| Minimum                |         | 53.75                       | 1.67                     | 15.78                |
| Maximum                |         | 65.62                       | 1.76                     | 17.80                |
| Sum                    |         | 17505.78                    | 493.37                   | 4875.74              |

As table 1 indicates, players mean weight, height, and age in the league season was (M=60.79kg ± 2.23kg) kilograms, (M=1.71m ± 0.01) meters, and (M=16.93 years ± 0.39) years respectively

**Table 2:** Descriptive Statistics of study participant players’ anthropometric profiles based on playing positions in the tournament season

| Players Playing Position in the league games | Descriptive statistics | Players Weight in Kilograms | Players Height in meters | Players Age in Years |
|--|------------------------|-----------------------------|--------------------------|----------------------|
| Defender Players<br>n=96                     | Mean                   | 61.6042                     | 1.7173                   | 16.9326              |
|  | Median                 | 61.3875                     | 1.7158                   | 17.0000              |
|  | Std. Deviation         | 1.69966                     | .01591                   | .36795               |
|  | Minimum                | 57.80                       | 1.68                     | 16.00                |
|  | Maximum                | 65.62                       | 1.76                     | 17.63                |
|  | Range                  | 7.82                        | .08                      | 1.63                 |
|  | Sum                    | 5914.00                     | 164.86                   | 1625.53              |
| Midfield Players<br>n=96                     | Mean                   | 61.3417                     | 1.7148                   | 16.8414              |
|  | Median                 | 61.2000                     | 1.7170                   | 16.9000              |
|  | Std. Deviation         | 1.77105                     | .01598                   | .35322               |
|  | Minimum                | 56.33                       | 1.67                     | 15.78                |
|  | Maximum                | 64.91                       | 1.75                     | 17.44                |
|  | Range                  | 8.58                        | .08                      | 1.67                 |
|  | Sum                    | 5888.80                     | 164.62                   | 1616.77              |
| Attacker Players<br>n=96                     | Mean                   | 59.4060                     | 1.7071                   | 17.0150              |
|  | Median                 | 59.7750                     | 1.7063                   | 17.0000              |
|  | Std. Deviation         | 2.47404                     | .02115                   | .42847               |
|  | Minimum                | 53.75                       | 1.67                     | 16.00                |
|  | Maximum                | 65.50                       | 1.76                     | 17.80                |
|  | Range                  | 11.75                       | .09                      | 1.80                 |
|  | Sum                    | 5702.97                     | 163.88                   | 1633.44              |
| Total<br>N=288                               | Mean                   | 60.7840                     | 1.7131                   | 16.9296              |
|  | Median                 | 61.0000                     | 1.7129                   | 17.0000              |
|  | Std. Deviation         | 2.23267                     | .01831                   | .38977               |
|  | Minimum                | 53.75                       | 1.67                     | 15.78                |
|  | Maximum                | 65.62                       | 1.76                     | 17.80                |
|  | Range                  | 11.87                       | .09                      | 2.02                 |
|  | Sum                    | 17505.78                    | 493.37                   | 4875.74              |

In the league, the players mean weight was M=60.78 kilograms with SD=2.23, mean height M=1.71 meters with SD=0.01 and mean age was M=16.92 years old with SD=.38.

The mean age of the players in the league season was 16.92 years old. The name of the league was “U17 male youth soccer premier league clubs’ tournament, 2015/16 season”. However, the result indicates that most of the players of the clubs age were very close to 17 years old. According to the league legislation of FIFA and EFF, the U17 league is the age category which does not include 17 years old and includes

player ages below 16.99 years old only. But, it is seen that most of the players’ age was approached to 17 years old in the league tournament season. This indicates that during selection of players, the coaches don’t give emphasis for player development as it is a youth player’s league and shows that the coaches give emphasis for the trophy.

In the league season, defender and midfielder players mean

weight was almost similar ( $61.60 \pm 1.69$  kilograms and  $61.34 \pm 1.77$  kilograms respectively). The height of the players was also more or less similar between defenders and midfielders ( $1.71 \pm .01$  and  $1.71 \pm .015$ ) respectively.

As Table 3 indicates the U17 players' weight, height and age descriptive statistics based on their playing zones in the league season. Accordingly, in the three zones of the U17 male youth premier league tournament, the players' mean weight, height, and age were detected. In the central zone, the players' mean weight, height, and age were ( $M=60.6931$ ,  $SD=2.27509$ ) kilograms, ( $M=1.71$ ,  $SD=0.01$ ) meters, and

( $M=16.87$ ,  $SD=0.40$ ) years old respectively. In the south-east zone, it was ( $M=60.60$ ,  $SD=2.04$ ) kilograms, ( $M=1.70$ ,  $SD=0.01$ ) meters, and ( $M=17.1445$ ,  $SD=0.23540$ ) years respectively. In the qualified zone, the players' weight, height, and age was ( $M=61.22$  kilo grams ( $SD=2.14986$ ) kilograms, ( $M=1.70$ ,  $SD=.017$ ) meters, and ( $M=16.99$ ,  $SD=.344$ ) years old respectively.

From this, we can conclude that the mean age of the players in south-east zone ( $17.14$ ,  $\pm 0.23$ ) were higher than the mean age of the players participated in the central zone ( $M=16.87 \pm 0.40$ ). However, the mean weight and height almost similar.

**Table 3:** Descriptive Statistics of DF, MDF, and ATTK players' Anthropometric profiles in the league zones based players league zones

| Descriptives        |                |                             |                          |                      |
|---------------------|----------------|-----------------------------|--------------------------|----------------------|
| Players League Zone |                | Players Weight in Kilograms | Players Height in meters | Players Age in Years |
| Central Zone        | Mean           | 60.6931                     | 1.7160                   | 16.8798              |
|                     | Median         | 60.7900                     | 1.7165                   | 16.9091              |
|                     | Std. Deviation | 2.27509                     | .01777                   | .40651               |
|                     | Minimum        | 53.75                       | 1.67                     | 15.78                |
|                     | Maximum        | 65.62                       | 1.76                     | 17.80                |
|                     | Range          | 11.87                       | .09                      | 2.02                 |
|                     | Sum            | 12381.40                    | 350.07                   | 3443.48              |
| South-East Zone     | Mean           | 60.6058                     | 1.7038                   | 17.1445              |
|                     | Median         | 61.0000                     | 1.7044                   | 17.1736              |
|                     | Std. Deviation | 2.04899                     | .01872                   | .23540               |
|                     | Minimum        | 54.75                       | 1.67                     | 16.75                |
|                     | Maximum        | 63.75                       | 1.75                     | 17.50                |
|                     | Range          | 9.00                        | .08                      | .75                  |
|                     | Sum            | 1818.17                     | 51.11                    | 514.33               |
| Qualified Zone      | Mean           | 61.2261                     | 1.7070                   | 16.9987              |
|                     | Median         | 61.3625                     | 1.7056                   | 17.0000              |
|                     | Std. Deviation | 2.14986                     | .01714                   | .34477               |
|                     | Minimum        | 54.20                       | 1.67                     | 16.11                |
|                     | Maximum        | 65.20                       | 1.75                     | 17.60                |
|                     | Range          | 11.00                       | .08                      | 1.49                 |
|                     | Sum            | 3306.21                     | 92.18                    | 917.93               |
| Total               | Mean           | 60.7840                     | 1.7131                   | 16.9296              |
|                     | Median         | 61.0000                     | 1.7129                   | 17.0000              |
|                     | Std. Deviation | 2.23267                     | .01831                   | .38977               |
|                     | Minimum        | 53.75                       | 1.67                     | 15.78                |
|                     | Maximum        | 65.62                       | 1.76                     | 17.80                |
|                     | Range          | 11.87                       | .09                      | 2.02                 |
|                     | Sum            | 17505.78                    | 493.37                   | 4875.74              |

#### 4. Discussion

The descriptive data about the players' weight, height, and age of the U17 male youth soccer players of Ethiopia in the 2015/16 league season shows that the average weight of the players was,  $M=60.78$ ,  $SD=2.23$  kilograms. The mean height of the players in the league was ( $M=1.71$ ,  $SD=.018$ ) meters, and the mean age of the players ( $M=16.92$ ,  $SD=.38$ ) years old.

From this it is possible to say that, the players' age was near to 17 years old and the clubs don't give emphasis for ages of 15 and 16-year players in the league.

The name of the league was titled as "U17 male youth soccer premier league clubs tournament, 2015/16 season". However, the players' age was almost approached to 17 years old which was 16.93 years old in average. The age category U17 includes ages from 15 and 16 years in principle. However, the Ethiopian U17 male youth soccer players' means age was so near to 17 years and the age distribution of the players in table 3 indicates most of the age of the players were around 16 and 17, which denies 14 and 15 years old. The results of the mean weight of the players demonstrated that their average weight was  $60.79 \pm 2.23$  kg in the league and the players'

weight was distributed around 57.77 to 60.92 kilograms. So, the average weight of the U17 male youth soccer players of Ethiopia was 60.79 kg. The mean height of the players was 1.71 meters in the league and their height was distributed around 1.70 to 1.72 meters and looks that most of the players were long in height and this is the preference of the coaches during selection indicates that the coaches prefer long players in height. However, as different studies explained players height may vary according to their playing positions and the role they play in it.

The minimum and maximum weight, height, and age of the players were also shown in table 1. As a result, the minimum and maximum weight of the players in the league was 53.75 and 65.62 kilograms respectively. The minimum and maximum height of the players in the league was 1.67 and 1.76 meters respectively. The minimum and maximum age of the players in the league was 15.78 and 17.80 in years.

The mean age of the players in the league season was 16.92 years. This mean age indicates that most of the players of the league clubs were more than 16 years old. According to the league legislation of the U17 male youth players of Ethiopian football federation, 2015/16; U17 league age category does

not include players who reach already 17 years old and includes player ages below 16.99 years old only. But, it is seen that most of the players' age was approached to 17 years old in the 2015/16 league tournament. This indicates that during selection of players, coaches don't give emphasis for player more young players.

Defender players and midfielder players mean weight was almost similar,  $M=61.60\pm 1.69$  kilograms and  $M=61.34\pm 1.77$  kilograms respectively in the league season. The mean height of the players was also similar between defenders and midfielders, which was calculated,  $M=1.72\pm 0.015$  and  $M=1.71\pm 0.015$  respectively.

<sup>[3]</sup> Different research findings indicate that performance in soccer is dependent on anthropometric parameters such as height, weight, leg length, body mass, physical fitness parameters such as strength, speed, explosive strength of lower extremities, speed endurance, endurance, flexibility and agility and psychological parameters such self-confidence, anxiety etc. As a result, coaches should give emphasis for the anthropometric characteristics of the U17 young Ethiopian male players.

### 5. Conclusion

This descriptive study was done in the U17 male youth soccer players of Ethiopia, 2015/16 tournament season. the focus of the study was about the players' description of their typical mean quantity of the selected anthropometric characteristics (weight and height) and age of the players in their tournament as a whole, based on their playing positions, and tournament zones, to describe these selected parameters (weight, height, and age).

As a result, the descriptive result of mean and standard deviation of the players' weight and height indicates that there was almost similar typical quantity in the defenders, midfielders, and attackers which do not consider their playing position role difference in the mentioned profiles. However, different scholars explained that because of the playing position and payers' role in each position, the players assigned in each playing positions shows differences in their weight and height. So, in addition to the players technical and physical skills, coaches and scout teams should look players' weight and height profiles in assigning players to different playing position of soccer game as the positions need different technical, tactical and physical demands from the players.

<sup>[3]</sup> Research findings indicate that players at different levels and in different playing positions also differed in the anthropometric parameters. Advanced countries identify the talents considering the performance determining factors and then develop the identified talents on scientific lines. No such efforts are being made in our country and hence low standard of soccer and hence we are not able to compete with our Asian counterparts even, leaving aside top South-American, European countries etc.

But the result of this study shows that less emphasis was given to players' weight and height by coaches when assigning players to different playing positions, defending, midfielder, and attacking positions.

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