

# Anthropometry of 12-Year-Old Football Athletes in Central Java

Mohamad Annas\*, Soegiyanto KS, Taufik Hidayat, Mugiyo Hartono, Adi S

Universitas Negeri Semarang, Indonesia

\*Corresponding Author: 3syakhustiani@mail.unnes.ac.id, adis@mail.unnes.ac.id

**Abstract.** One of the essential factors in talent scouting is anthropometry. This study aims to determine the anthropometry of SSB KU 12 students. This research method is quantitative and non-experimental. The number of samples in this study was 201 football athletes in Central Java. Sample selection total sampling. This study observed several items: height, weight, head circumference, arm circumference, abdominal circumference, thigh circumference, chest circumference, arm length, and leg length. Anthropometric factors are essential in fostering football achievement. This study still has limitations in determining the criteria for athletes. The results of this study are used as a reference in making decisions. Hopefully, there will be further research on fat mass and football athletes' technical, physical, and psychological aspects.

**Key words:** Anthropometry, Athlete, Football

**How to Cite:** Annas, M., KS, S., Hidayat, T., Hartono, M., Adi, S. (2022). Anthropometry of 12-Year-Old Football Athletes in Central Java. *ISSET: International Conference on Science, Education and Technology* (2022), 777-780.

## INTRODUCTION

Currently, the game of football is developing very rapidly. The number of football schools (SSB) to develop the talents, interests, and potential of early childhood so that later they can make the country proud to excel in the world of football domestically and abroad. For a football team, many critical factors for the success of anthropometric and physiological characteristics are essential factors in sports performance (Sutton et al., 2009). However, evaluating body composition in soccer players helps improve their performance and evaluate the results of the implemented training plan (Sutton et al., 2009).

In addition to the association with injury risk, it is also possible to find an association between fat mass and some physiological performance characteristics, such as speed (Lago-Peñas et al., 2011). In connection with this, we know that body fat percentage (% BF) is a crucial determinant variable in the performance of soccer players (Nikolaidis et al., 2016). However, body composition assessment incorporates several difficulties. Each technique presents advantages but also has limitations (Ackland et al., 2012). We know that a wide variety of methods without standardization (Meyer et al., 2013) leads to quite different results (Leão et al., 2017), so it is often impossible to compare samples from different studies. Despite the validity of using an equation based on skin folds (Skin Fold Caliper) to assess

body composition, one of the assumptions is that the choice of the formula used validates in the same population (Meyer et al., 2013).

In Football, one of the most prominent sports worldwide, coaches are part of highly professional talent identification and development system (Mills et al., 2012). Author sees various ways of identifying talent in the age group of 12. The age group 12 chooses the beginning of the athlete's career development. This study aims to observe the anthropometry of football school students.

## METHOD

This research is quantitative with a non-experimental design. The sample is SSB (School of Football) athletes from ssb in Central Java. The sample is 221 SSB students. Sample selection using total sampling. The sample selected was the age group 12. This research was conducted in 2022. The data obtained were processed using descriptive statistics. Retrieval of research data was carried out by measuring the anthropometric variables in this study, including measuring the variables of height and weight. Head circumference, arm circumference, abdominal circumference, thigh circumference, chest circumference, arm length and leg length. The data analysis used in this research is descriptive quantitative.

## RESULT AND DISCUSSION

**Table 1.** Result

	N	Minimum	Maximum	Mean	Std Deviation
Height	201	120	169	142.8	10.09
Weight	201	20	105	38.3	11.61
Head Circumference	201	49	62	53.28	1.99
Arm Circumference	201	13	36	22.14	3.31
Abdominal Circumference	201	52	103	64.90	9.28
Thigh Circumference	201	28	65	40.35	5.41
Chest Circumference	201	51	110	68.88	9.30
Arm Length	201	49	79	61.44	5.17
Leg Length	201	79	104	82.65	7.88

The content of table 1 above is a summary of the Anthropometric variable measurements of 201 SSB students. Anthropometric factors measured in this study include height and weight. Head circumference, arm circumference, abdominal circumference, thigh circumference, chest circumference, arm length, and leg length. Based on the data in table 1 above, it can be explained that the lowest score for height is 120cm, and the highest score is 169cm. For weight, the lowest score is 20kg, and the highest is 105kg. The lowest head circumference score was 49cm, and the highest was 62cm. For arm circumference, the lowest score is 13cm, and the highest is 36cm. The lowest value for abdominal circumference is 52cm, and the highest is 103cm. For thigh circumference, the lowest score is 28cm, and the highest is 65cm. The lowest score for the chest circumference is 51cm, and the highest is 110cm. For arm length, the lowest score was 49cm, and the highest was 79cm; for leg length, the lowest score was 79cm, and the highest was 104cm.

Adolescent growth follows a typical pattern for age (Canhadas et al., 2011). However, differences in height, weight, and body fat mass concerning playing position (Nikolaidis & Vassilios Karydis, 2011), noting that significant differences during the development process impact the playing position of the show. The state of maturation of young players' selection factors leads to greater weight and height of selected players compared to unselected players (Gil et al., 2007), providing salients to the discussion of relative age and potential impact on the future. These athletes.

A review of the literature on soccer players showed significant differences in anthropometric measures across playing positions (Arnason et al., 2004; Carling et al., 2012; Carling & Orhant, 2010; Dellal et al., 2015; Milanese et al., 2015; Peñas et al., 2014; Sutton et al., 2009; Towlson et al., 2017), as well as between age categories

(Canhadas et al., 2011; Deprez et al., 2015; Lago-Peñas et al., 2011; le Gall et al., 2010). The anthropometric characteristics of athletes are essential factors of success in sports (Brunkhorst & Kielstein, 2013).

## CONCLUSION

Anthropometric factors are essential in the development of football achievements. Several aspects of this study were height, weight, head circumference, arm circumference, abdominal circumference, thigh circumference, chest circumference, arm length, and leg length. This study still has limitations in determining the criteria for athletes. Hopefully, there will be further research on fat mass technical, physical, and psychological aspects of soccer athletes.

## REFERENCES

- Ackland, T. R., Lohman, T. G., Sundgot-Borgen, J., Maughan, R. J., Meyer, N. L., Stewart, A. D., & Müller, W. (2012). Current status of body composition assessment in sport: review and position statement on behalf of the ad hoc research working group on body composition health and performance, under the auspices of the I.O.C. Medical Commission. *Sports Medicine (Auckland, N.Z.)*, 42(3), 227–249. <https://doi.org/10.2165/11597140-000000000-00000>
- Arnason, A., Sigurdsson, S. B., Gudmundsson, A., Holme, I., Engebretsen, L., & Bahr, R. (2004). Physical fitness, injuries, and team performance in soccer. *Medicine and Science in Sports and Exercise*, 36(2), 278–285. <https://doi.org/10.1249/01.MSS.0000113478.92945.CA>
- Brunkhorst, L., & Kielstein, H. (2013). Comparison of anthropometric characteristics between professional triathletes and cyclists. *Biology of Sport /*

- Institute of Sport*, 30, 269–273. <https://doi.org/10.5604/20831862.1077552>
- Canhadas, I., Silva, R., Chaves, C., & Portes, L. (2011). Características antropométricas e de aptidão física de meninos atletas de futebol. *Revista Brasileira de Cineantropometria e Desempenho Humano*, 12. <https://doi.org/10.5007/1980-0037.2010v12n4p239>
- Carling, C., Le Gall, F., & Malina, R. M. (2012). Body size, skeletal maturity, and functional characteristics of elite academy soccer players on entry between 1992 and 2003. *Journal of Sports Sciences*, 30(15), 1683–1693. <https://doi.org/10.1080/02640414.2011.637950>
- Carling, C., & Orhant, E. (2010). Variation in body composition in professional soccer players: interseasonal and intraseasonal changes and the effects of exposure time and player position. *Journal of Strength and Conditioning Research*, 24(5), 1332–1339. <https://doi.org/10.1519/JSC.0b013e3181cc6154>
- Dellal, A., Lago-Peñas, C., Rey, E., Chamari, K., & Orhant, E. (2015). The effects of a congested fixture period on physical performance, technical activity and injury rate during matches in a professional soccer team. *British Journal of Sports Medicine*, 49(6), 390–394. <https://doi.org/10.1136/bjsports-2012-091290>
- Deprez, D., Buchheit, M., Fransen, J., Pion, J., Lenoir, M., Philippaerts, R. M., & Vaeyens, R. (2015). A longitudinal study investigating the stability of anthropometry and soccer-specific endurance in pubertal high-level youth soccer players. *Journal of Sports Science & Medicine*, 14(2), 418–426.
- Gil, S., Ruiz, F., Irazusta, A., Gil, J., & Irazusta, J. (2007). Selection of young soccer players in terms of anthropometric and physiological factors. *The Journal of Sports Medicine and Physical Fitness*, 47(1), 25–32.
- Lago-Peñas, C., Casais, L., Dellal, A., Rey, E., & Domínguez, E. (2011). Anthropometric and physiological characteristics of young soccer players according to their playing positions: relevance for competition success. *Journal of Strength and Conditioning Research*, 25(12), 3358–3367. <https://doi.org/10.1519/JSC.0b013e318216305d>
- le Gall, F., Carling, C., Williams, M., & Reilly, T. (2010). Anthropometric and fitness characteristics of international, professional and amateur male graduate soccer players from an elite youth academy. *Journal of Science and Medicine in Sport*, 13(1), 90–95. <https://doi.org/10.1016/j.jsams.2008.07.004>
- Leão, C., Simões, M., Silva, B., Clemente, F. M., Bezerra, P., & Camões, M. (2017). Body Composition Evaluation Issue among Young Elite Football Players: DXA Assessment. *Sports (Basel, Switzerland)*, 5(1). <https://doi.org/10.3390/sports5010017>
- Meyer, N. L., Sundgot-Borgen, J., Lohman, T. G., Ackland, T. R., Stewart, A. D., Maughan, R. J., Smith, S., & Müller, W. (2013). Body composition for health and performance: a survey of body composition assessment practice carried out by the Ad Hoc Research Working Group on Body Composition, Health and Performance under the auspices of the IOC Medical Commission. *British Journal of Sports Medicine*, 47(16), 1044–1053. <https://doi.org/10.1136/bjsports-2013-092561>
- Milanese, C., Cavedon, V., Corradini, G., De Vita, F., & Zancanaro, C. (2015). Seasonal DXA-measured body composition changes in professional male soccer players. *Journal of Sports Sciences*, 33(12), 1219–1228. <https://doi.org/10.1080/02640414.2015.1022573>
- Mills, A., Butt, J., Maynard, I., & Harwood, C. (2012). Identifying factors perceived to influence the development of elite youth football academy players. *Journal of Sports Sciences*, 30. <https://doi.org/10.1080/02640414.2012.710753>
- Nikolaidis, P. T., Ruano, M. A. G., de Oliveira, N. C., Portes, L. A., Freiwald, J., Leprêtre, P. M., & Knechtle, B. (2016). Who runs the fastest? Anthropometric and physiological correlates of 20 m sprint performance in male soccer players. *Research in Sports Medicine (Print)*, 24(4), 341–351. <https://doi.org/10.1080/15438627.2016.1222281>
- Nikolaidis, P. T., & Vassilios Karydis, N. (2011). Physique and body composition in soccer players across adolescence. *Asian Journal of Sports Medicine*, 2(2), 75–82. <https://doi.org/10.5812/asjasm.34782>
- Peñas, C., Rey, E., Casais, L., & Gómez López, M.

- (2014). Relationship Between Performance Characteristics and the Selection Process in Youth Soccer Players. *Journal of Human Kinetics*, 40, 189–199. <https://doi.org/10.2478/hukin-2014-0021>
- Sutton, L., Scott, M., Wallace, J., & Reilly, T. (2009). Body composition of English Premier League soccer players: Influence of playing position, international status, and ethnicity. *Journal of Sports Sciences*, 27, 1019–1026. <https://doi.org/10.1080/02640410903030305>
- Towlson, C., Cobley, S., Midgley, A. W., Garrett, A., Parkin, G., & Lovell, R. (2017). Relative Age, Maturation and Physical Biases on Position Allocation in Elite-Youth Soccer. *International Journal of Sports Medicine*, 38(3), 201–209. <https://doi.org/10.1055/s-0042-119029>