



The Association between Soccer Players' Anthropometric Traits and their Level of Physical Fitness

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ABSTRACT:

Higher sports performance is based on physical fitness. The current study aimed to investigate the relationship between soccer players' anthropometric traits and physical fitness. A total of fifty intercollegiate football players from Andhra University in Visakhapatnam, Andhra Pradesh, India, representing a range of positions, were chosen for this study. The soccer players ranged in age from 19 to 25. To determine the relationship between anthropometrics and physical fitness performance, the Pearson correlation coefficient was employed. A significance level of 0.05 was established.

Keywords: Anthropometric, physical fitness, soccer

INTRODUCTION

The game of soccer is extremely popular worldwide, particularly in European nations. Running, passing, kicking, tackling, blocking, heading, juggling, and dribbling are some of the skills involved. All of these tasks frequently need to be completed quickly. There are physical challenges in football. Despite having similar skill sets, two players may perform very differently due to differences in their physical and mental reactions. A player needs to be able to react and assess situations quickly. The Elite junior Australian football team's rules are determined in part by anthropometric measurements and physical conditioning, according to Keogh (1999). The fact that millions of people play soccer at a lower level shows how popular the game is. Nowadays, soccer is played in more than 210 nations worldwide. Soccer's popularity might be attributed to its simplicity, requiring very little equipment and infrastructure. Stepnicka (1974). The anthropometric characteristics of football defenders and midfielders will differ significantly from one another. Singh, B., and A. Singh (2015). Only at the highest load did the subject's body weights explain a significant portion of the variation in front squat performance. Overall, the best indicators of front squat performance variance were body mass index and the weight/torso length ratio. The findings imply that anthropometry can accurately predict college football players' front squat performance. Shepherd (2010). Young soccer players seem to have varying performance abilities across positions. Anthropometry can distinguish between physical abilities and soccer talents, giving coaches a scientific justification for their practice of choosing young players. Brahim (2013). A team that does not have the option to hand-pick players based on anthropometric characteristics may be at a disadvantage, according to Hailu (2016), who suggested that within-position variation was fairly large in some cases. For this reason, the relevant soccer coaches and sport science professionals should consider the principle of morphological optimization when identifying, detecting, and choosing soccer players. Apposition specificity of anthropometric traits across age groups was noted by Leão (2019). Furthermore, multiple validated equations were supported by the same data, leading to significant variations in the outcome projections. According to Veale (2010), there are variations in the body composition of the top junior athletes, and their growth is observed in a linear pattern. This knowledge helps develop training plans and expectations that are appropriate for the athletes' age. Studies examining the relationship between anthropometric traits and physical fitness performance are scarce.

MATERIALS AND PROCEDURES

Fifty soccer players, ages 19 to 25, were chosen from an intercollegiate football competition hosted at Andhra University in Visakhapatnam, Andhra Pradesh, India. All subjects were informed of the study's purpose and methodology, and they willingly agreed to take part.

HYPOTHESIS

The performance of physical fitness and anthropometric traits will not be significantly correlated.

Measurements of Anthropometric Variables

- Gross Body Measurements

- Standing Height (cm)
- Body Weight (kg)
- Length of Body Parts (cm)
- Upper Leg Length
- Lower Leg Length
- Upper Arm Length
- Lower arm Length
- Diameters of Body Parts (cm) Bicondylar Humerus Diameter
- Biacromial Diameter
- Hip Diameter
- Bicondylar Femur Diameter
- Girth of Body Parts (cm)
- Biceps Muscle Girth
- Calf Muscle Girth

Measures of Physical Fitness

The AAHPER juvenile fitness test is regarded as a test comprising items that measure every aspect of physical fitness.

- Pull the Ups
- Bent knee sit-ups (sixty seconds)
- 4 X 10 m the shuttle run
- Standing broad jump
- 50-yard dash 6. 600 Yd run/ walk

METHODOLOGY

All subjects were informed of the study's detailed methodology and signed a written consent form. Within two days, the subjects' measurements were obtained. All anthropometric measurements were taken on the first day, and on the second day, the AAHPER juvenile fitness test was conducted.

Measurements

As directed by the International Society for the Advancement of Kinanthropometry (ISAK), an anthropometric evaluation was conducted. Performance is defined as the sum of the players' AAHPER youth fitness test results.

FINDINGS

Table 1 shows the relationship between intercollegiate soccer players' anthropometric traits and physical fitness levels.

Variables	Mean	Standard deviation	Correlation
Weight	63.05	4.1176	-0.068
Height	169.8	2.66	0.211
Biacromial diameter	39.61	2.2846	-0.123
Bicondylar Femur diameter	8.127	0.461	0..108
Bicondylar Humerus Diameter	5.53	0.1	-0.02
Hip diameter	30.93	2.0243	-0.3.21
Upper arm length	30.45	1.7403	-0.248

Variables	Mean	Standard deviation	Correlation
Lower arm length	21.87	1.408	0.140
Upper leg length	48.41	2.591	0.308
Lower leg length	48.41	3.591	0.194
Biceps muscle girth	23.77	1.5816	0.0644
Calf muscle girth	30	2.48	0.02

Table 1 indicates that physical fitness performance is positively correlated with height, bicondylar femur diameter, lower arm length, upper leg length, lower leg length, biceps muscle girth, and calf muscle girth. Consequently, our theory has been disproved. Our hypothesis has been accepted if, on the other hand, table -1 demonstrates a negative correlation between physical fitness performance and weight, biacromial diameter, bicondylar humerus diameter, hip diameter, and upper arm length. In sports performance, certain anthropometric traits offer a biomechanical advantage. Longer limbs are advantageous in running and jumping competitions. Since muscular force is directly proportional to muscle cross sectional area, a larger muscular girth indicates a larger muscle cross sectional area. Therefore, a larger biceps muscle circumference gives you more muscle power to raise your body during pull-ups and more momentum during the 50-meter dash and standing wide jump.

CONCLUSION AND DISCUSSION

This supports the idea that competitive sports require a certain physical setup. A specific body type, size, shape, and proportion are required for high-level performance. Athletes' bodily profiles and their performance on particular activities are highly correlated by numerous studies. According to Hirata (1966), a country whose citizens' overall physical attributes are restricted to those of champions in particular sports should focus its training regimen exclusively on those sports. Carter (1982) also proposed that athletes who want to compete at a high level should compare their bodies to those of Olympic competitors. Sports performance is influenced by anthropometric traits and physiological considerations. When identifying talent and creating a training regimen for any activity, coaches and physical education instructors need to consider these factors. Additionally, Reilly (2000) came to the conclusion that anthropometric and physiological standards do play a part in the comprehensive monitoring of young athletes with potential.

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