HEIGHT AND WEIGHT AS DETERMINANTS OF PLAYING POSITIONS IN NIGERIA PROFESSIONAL LEAGUE FOOTBALL PLAYERS IN NORTH CENTRAL NIGERIA

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Abstract
This study assessed height and weight as determinants of playing position among elite football players in North Central Zone, Nigeria. The study adopted a cross-sectional ex post-facto research design. The sample of the study was 138 elite football players who were selected from six clubs in the Nigeria Professional League, in North Central Nigeria, using purposive sampling procedure. Participants' anthropometric measures (height and weight) were measured in accordance with the international standards for anthropometric assessment of the International Society for the Advancement of Kinanthropometry (ISAK). Performance of players was assessed based on the position of the team on the league table. The teams that were in the top ten of the league table were considered to have good performance and were assigned 2. Teams who were from eleven to twenty were considered to have poor performance and were assigned 1. Simple percentages were used to analyse and describe the playing positions of the players. Mean and standard deviation were used to analyse the height and weight of the players. Partial correlation analysis was done to determine if relationship exists between anthropometric measures (height and weight) of players and their playing positions at 0.05 alpha level. All the analyses were conducted using the Statistical Package for Social Sciences (SPSS, v 21). The result of the study indicated that height and weight are not significant determinant of goalkeeping (r(15) = .291, N =18, p = .258.), defence (r(39) = .010, N =42, p = .952), midfield (r(39) = .136, N =42, p = .395.) and attack (r(33) = .143, N =36, p = .413) among football players in North Central Zone of Nigeria. It was recommended among others that coaches should marry anthropometric measures with other parameters in choosing their players for optimum performance.

Introduction

Football, the world's most popular sport, involves two teams with eleven players each. The objective is to manoeuvre the ball into the opposing team's goal using any part of the body except the hands and arms. The goalkeeper is the only player allowed to handle the ball within the goal area. The team that scores the most goals within the 90-minute playtime emerges as the winner. Football can be played in various settings, ranging from official pitches to gymnasiums, streets, school playgrounds, parks, and beaches. As stated by Alslan and Koc (2015), the game attracts a large number of players and spectators worldwide. The Fédération Internationale de Football Association (FIFA), the governing body of football, estimated that by the year 2000, there were approximately 250 million football players and over 1.3 billion people were interested in the sport (Reilly, 2010). Further statistics as documented by Smith (2023) further reveals that football has an estimated total of 275 million players globally, with 128,983 professionals from 3,903 clubs and 211 current FIFA member countries.

Football is played by individuals of various ages and skill levels. The performance in football depends on a multitude of factors, including technical/biomechanical, tactical, mental, and physiological aspects. One of the reasons for football's worldwide popularity is that players do not necessarily require extraordinary abilities in any specific performance area, but rather a reasonable level of proficiency in all areas. However, there is a growing trend towards more systematic training and selection processes that influence the physical characteristics of players competing at the highest level (Aslan & Koç, 2015).

Football has the potential to generate substantial income for various stakeholders, including players, sports personnel, coaches, and the entire nation. Footballers receive significant financial rewards, which serve as a strong incentive for them to perform better. Similarly, coaches are also generously compensated for their coaching responsibilities. The national government can benefit from football through various means such as taxes, grants, and wages associated with football-related activities. Furthermore, if a football team excels in international competitions like the World Cup, it can bring recognition and rewards to the nation. Success on the football field and the privilege of hosting events can contribute to the growth of GDP, retail sales, and tourism. These findings indicate that sporting achievements can indeed have a positive impact on local development. Therefore, football has the potential to create income and employment opportunities at the local level (Kose, 2020).

Due to the high value placed on football, players, coaches, and the government have collaborated to ensure peak performance. These efforts cover a range of factors, including anthropometric variables. Anthropometrics involves analysing measurements and capabilities of the human body. In football, there is a focus on anthropometric traits like height, body mass, and body mass index. Height signifies vertical distance, indicating how tall a person is. Weight, on the other hand, reflects the mass of the body, determining heaviness. Karakulak (2019) states that success in football is influenced by tactical, biomechanical, mental, and physiological factors. Football has progressed significantly in recent years through scientific studies, enhancing the technical, tactical, and physical aspects of players. The synergy between football and science has improved player conditions, training programs, awareness of player well-being, and spectator enjoyment.

In football, like in all other sports, achieving success is dependent on enhancing athletes' performance to the highest degree and sustaining this performance over an extended period. The key elements influencing performance levels in football include talent, health, strength, endurance, speed, flexibility, balance, as well as technical and tactical proficiency (Schiff, 2007). In today's football world, there is a widespread expectation for players in all positions to enhance their physical and physiological capabilities to the highest extent. This is primarily because football is played across a vast area and involves diverse tasks assigned to players, necessitating a localized evaluation of their physical and physiological requirements (Marancı & Müniroğlu, 2001). Football not only varies from other sports but also within its own positions and playing styles. Each player assumes crucial and distinct roles throughout the game. As a result of the ever-evolving roles, the demands on players' physical and physiological aspects increase significantly (Göral et al., 2012).

Anthropometric variables such as weight and height are crucial in football. Recent research on the relationship between weight and height in different football positions sheds light on how these physical characteristics vary and impact performance. Various studies have shown significant disparities in the height and weight of players across different positions, which subsequently affect their roles and effectiveness on the field. For example, Toro-Román et al. (2023) discovered that goalkeepers tend to be the tallest and heaviest players. Their increased height and weight provide them with an advantage in reaching and blocking shots, as well as in physical confrontations within the penalty area. The authors also noted that central defenders generally have above-average height and weight. This physical presence assists them in aerial duels and physical battles with opposing forwards. However, they are typically lighter and shorter than goalkeepers but heavier and taller than midfielders and forwards. Similarly, Michailidis (2024) stated that midfielders are typically the shortest and lightest players. Their role demands high agility, stamina, and quick changes of direction. These attributes are facilitated by a lighter and more compact physique, which supports endurance and agility (Goral, 2024). Forwards, on the other hand, require a combination of height for aerial ability and lower weight for speed, resulting in a moderate build. They are generally lighter than defenders and goalkeepers but heavier than midfielders. This balance helps them maintain speed while possessing enough physicality to compete for the ball and protect it from defenders (Toro-Román et al., 2023; Goral, 2024).

In developed nations around the world, research as state above has reached an advanced stage. Numerous studies have indicated a positive correlation between the anthropometric characteristics of football players and their playing ability, particularly in relation to their position on the field. However, in Nigeria, such studies are scarce. This lack of research may help explain why the country's performance in the CAF championship is typically subpar when compared to their counterparts. Against this backdrop, the current study aimed to investigate the role of height and weight as determinants of playing positions in elite football players from the North Central Zone of Nigeria. The primary objective of this study was to evaluate the influence of height and weight on playing positions in the Nigeria Professional League (NPL) football players in the North Central Zone of Nigeria.
Methods

The ex post facto cross sectional research design was used. The sample of the study was 138 football players who were selected using a purposive sampling procedure from six football clubs (Kwara United of Kwara State, Lobi Stars of Benue State, Nasarawa United of Nasarawa State, Niger Tornados of Niger State, Plateau United of Plateau State and Wikki Tourists of Bauchi State) that registered for the 2022/2023 Nigeria Professional Football League (NPFL) in North Central Nigeria.

Assessment of Height
Participants' height was measured with a flexible steel tape (Seca, Hamburg, Germany) in accordance with the protocol of the International Society for the Advancement of Kinanthropometry [ISAK] (2010). Participants stood bare-footed with feet together on a level cemented floor, the upper back, buttocks and heels touching the wall, the head held erect and the eyes looking forward so that the orbitale ® (lower margin of the eye socket) and the tragion ® (the notch superior to the tragus of the ear) were in the Frankfort plane. The point of the greatest height to the nearest 0.1cm was marked off on the wall with a flexible steel tape.

Assessment of Weight: Weight was measured using a digital weighing scale and was recorded to the nearest 0.1kg.

Assessment of Playing Position: Participants were given a proforma where they were required to indicate their playing positions

Assessment of Performance: Performance of players was assessed based on the position of the team on the league table. The teams that were in the top ten on league table were considered to have good performance and were assigned 2. Teams who were from eleven to twenty were considered to have poor performance (and were assigned 1).

Method of Data Analysis
Descriptive and inferential statistics were used for data analysis data for this study. Simple percentages were used to analyse and describe the playing positions of the players. Mean and standard deviation were used to analyse the height and weight of the players. Partial correlation analysis was computed to determine if relationship exist between anthropometric measures (height and weight) of players and their playing positions at 0.05 alpha level. All the analyses were conducted using the Statistical Package for Social Sciences (SPSS v 21).

Results

The results of the study are presented below.

Table 1:

Demographic Characteristics of the participants (n=138)

Playing Position	Frequency	Percentage (%)
Goal Keeper	18	13.0
Defender	42	30.4
Mid Fielder	42	30.4
Attacker	36	26.1
Total	**138**	**100.0**
Performance	**Frequency**	**Percentage**
Poor	69	50.0
Good	69	50.0
Total	**138**	**100.0**
Variable	**Mean**	**SD**
Age	27.46	5.01
Weight (kg)	64.29	5.17
Height_in_m	1.71	.07

Data in table 1 indicated that 13% of the respondents were goal keepers, 304% were defenders, 30.4% were mid fielders and 26.1% were attackers. The performance analysis indicated that 50% had good performance (top ten based on league table) and 50% had poor performance (from eleven to twenty on the league table). The analysis indicated that the mean age of the players was 27.46±5.05 years. The mean weight of the respondents was 64.29±5.17kg and the mean height was 1.71±0.7m.

Table 2:

Mean Analysis of the Height and Weight of Players Based on Playing Position

Playing Position	N	Height (in metres)		Weight (in kg)	
		Mean	SD	Mean	SD
Goal keepers	18	1.79	.04	66.00	7.95
Defenders	42	1.74	.07	63.86	4.87
Mid fielders	42	1.68	.05	64.40	4.71
Attackers	36	1.69	.05	63.82	4.27

Results presented in table 2 indicated that, average height of the players was 1.79±0.4 for goal keepers, 1.74±0.07 for defenders, and 1.68±0.05 for midfielders and 1.69±0.05 for attackers respectively. Goalkeepers were taller than all the other playing positions on the average followed by defenders. Midfielders were the shortest of all the playing positions. Data in table 2 also indicated that, average weight of the players was 66.00±7.95 for goalkeepers, 63.86±4.87 for defenders, and 64.40±4.71 for midfielders and 63.82±4.27 for attackers respectively. Goalkeepers had greater body mass than players of other playing positions and were followed by the midfielders. Attackers weighed less than all other playing positions.

Table 3:
Partial Correlation analysis of weight and height as determinants of Playing Position

Sn	Playing Position	N	R	P	Sig
1.	Goalkeeping	18	.291	.258	p>0.05
2.	Defence	42	.010	.952	p>0.05
3.	Midfield	42	.136	.395	p>0.05
4.	Attack	36	.143	.413	p>0.05

Data in table 3 indicated a partial correlation of height and weight whilst controlling for playing position. There was no partial correlation between height and weight whilst controlling for playing position which was statistically insignificant, r (15) = .291, N =18, p = .258. It therefore means that height and weight were not significant determinants of goalkeeping position in elite football in North Central Zone, Nigeria.

Data in table 3 also indicated a partial correlation of height and weight whilst controlling for playing position. There was no partial correlation between height and weight whilst controlling for playing position as it was statistically insignificant, r (39) = .010, N =42, p = .952. It therefore means that height and weight are not significant determinants of defence playing position in elite football players in North Central Zone, Nigeria.

The result presented in table 3 further indicated a partial correlation of height and weight whilst controlling for playing position. There was no partial correlation between height and weight whilst controlling for playing position which was statistically insignificant, r (39) = .136, N =42, p = .395. It therefore means that height and weight are not significant determinant of midfield playing position in elite football players in North Central Zone, Nigeria.

Further results as presented in table 3 indicated a partial correlation of height and weight whilst controlling for playing position. There was no partial correlation between height and weight whilst controlling for playing position which was statistically insignificant, r (33) = .143, N =36, p = .413. It therefore means that height and weight are not significant determinant of attacking playing position in elite football players in North Central Zone, Nigeria.

Discussion of the Findings
The main purpose of this study was to assess height and weight as determinant of playing positions in elite football players in North Central Zone, Nigeria. The results of the study indicated that height and weight are not significant determinant of goalkeeping position in elite football players in North Central Zone, Nigeria. The result of the study was at variance with previous findings. For instance, Hailu and Tomay (2016) determined the anthropometric measurement and body composition characteristics of south west Ethiopian beginner football players' considering playing position and found that the sitting height and standing height of the goal keepers 85.1 ± 5.4cm, 176.6 ± 6.1, were higher than other field positions. These characteristics would help GKs in aerial duels allowing them to defend their goals. Goalkeepers tend to be taller than average because their greater arm spans and total reach when jumping enable them to cover more of the goal area. In the same vein, Hailu and Tomay's (2016) study showed significant differences between playing position standards concerning the

anthropometric measures, especially body weight. The result was in agreement with Gill (2007) that GKs were heavier than other playing position groups. They were consistent in part with the findings of Malina et al. (2011) who from their study of football players aged 11 to 16yrs reported that the forwards were taller than defenders, and that goalkeepers were heavier than midfielders. The data were also similar to those reported by Slavko et al. (2011) in amateur German football players. The goalkeepers were also significantly heavier than the midfielders and strikers. The discrepancy in the result of the study and previous studies is not far-fetched; there are other parameters to determine performance in football which anthropometric measures may just be an aspect. Shorter goalies may have comparative advantage in other parameters too.

In the same vein, the result of the study showed that, height and weight are not significant determinants of defence playing position in elite football players in North Central Zone, Nigeria. The result of the study was at variance with Hailu and Tomay (2016) who found in south west Ethiopian beginner football players' that defenders were the tallest 88 ± 4.6cm. Information gathered from [(Wikipedia, n.d)](#) further reviewed that, height is often an advantage for [defenders](#), who are assigned to stop forwards from scoring through the air. Similarly, Clark (2017) reported in his study that the defenders were significantly heavier than the strikers, but did not differ significantly from the midfielders. Defenders tend to be heavier and taller with less body fat, as their position requires them to be robust and strong in the tackle.

Furthermore, the study found that height and weight are not significant determinant of midfield playing position in elite football players in North Central Zone, Nigeria. This finding is consistent with previous research, which indicates that while these anthropometric traits differ across various positions, they are not crucial for midfielders. For instance, Gil et al. (2007) earlier documented that midfielders are generally characterized by greater aerobic capacity and endurance rather than by specific anthropometric traits. Their role requires high levels of stamina and agility rather than particular height or weight standards. In the same vein, Shovlin et al. (2017) stated that, while certain physical characteristics like height and weight are more crucial for positions such as goalkeeper or central defender, midfielders depend more on agility, stamina, and tactical awareness, which are not necessarily related to these anthropometric characteristics. Putting it together, the evidence indicates that although height and weight might affect suitability for specific football positions, they are not key determinants for midfielders, whose performance is more closely associated with physiological and tactical factors.

Finally, the result of the study indicated that height and weight are not significant determinant of attacking playing position in elite football players in North Central Zone, Nigeria. Further findings on anthropometric measures of players and attacking position are controversial. Leung (2019) stated that players who specialise in playing as a target are usually of above-average height with good heading ability and an accurate shot. Moreover, the variation in physical demands across different regions and leagues might also contribute to this finding. In African football contexts, where the game might emphasize different physical or tactical approaches compared to European or South American leagues, the reliance on height and weight for specific positions, particularly for attackers, may be less pronounced. Research by Towlson et al. (2017) highlighted that while physical characteristics can influence position allocation in youth soccer, these influences vary significantly based on developmental stage and local playing

styles. According to Wilson (2011), for wide and attacking positions, the players are generally relatively shorter. Many of the world class players have been shorter than average to average and, in many cases, gained an advantage from their low centre of gravity. In order to achieve this higher level, Gil et al (2007) claim that the relationship between the physiological demands of football and the composition of the player's body is of considerable importance. Although all too often, the judgement concerning optimal playing body fat is made on a trial and error basis with reference to body mass alone, disregarding the players overall body composition characteristics.

Conclusion
In line with the results of the study, the following conclusions were made: Height and weight are not significant determinant of playing position in elite football players in North Central Zone, Nigeria.

Recommendations
The following recommendations were made based on the conclusions drawn:
1. Coaches should marry anthropometric measures with other parameters in choosing their players for optimum performance.
2. The football trainers and coaches should focus more on game tactics and strategies on the mid fielders for optimum performance instead of relying on height and weight measures as determinants of playing position.
3. Goal scoring which is the primary role of attackers demands keen concentration and positive psyche. Coaches can dwell on training attackers to be more coordinated and focused during play. This will produce more positive results than banking on tall and heavy players who may be sluggish with low self-esteem.

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