

Differences in Anthropometry (Height) for Each Playing Position of Women's Basketball Athletes

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Abstract: There are many studies on anthropometry (height) in sports, but anthropometric research (height) in team sports which requires playing positions, especially in basketball, is still limited. Although there are several studies on the sport of basketball that are oriented towards playing positions, they are still limited to the physical component. While research that is oriented towards anthropometry (height) playing positions is still limited and all are oriented towards the three groups of playing positions namely guard, forward and center. The aim of the study was to look at the differences in anthropometry (height) for each player's position based on five positions, namely point guard, shooting guard, small forward, power forward, and center. The research method uses a quantitative descriptive design with a retrospective causal comparative design or ex-post facto design. The sample is 20 basketball athletes from 27 districts and cities in West Java. Data analysis using SPSS software with one way-ANOVA test. The results of the study showed that there were differences in anthropometry (height) for each basketball athlete's playing position.
Keywords: Anthropometry, Playing Position, Basketball

INTRODUCTION

Basketball is a group game sport consisting of two teams of five people each competing to score points by throwing the ball into the opponent's basket. This is in accordance with FIBA (2018) Basketball is played by two teams, each consisting of 5 players. The goal of each team is to score into the opponent's basket and try to prevent the opposing team from scoring. Basketball is suitable for watching because it is played in an open or closed sports room and only requires a relatively small field. In addition, basketball is also more dynamic and competitive because the tempo of the game tends to be faster when compared to other sports. Basketball game is a series of activities that are planned and must be carried out by each player in relation to the position and role in the determined tactics (Ajay, Bhadu. & Poonam, Singh. 2017; Trninic. Selekcija, Priprema. Vođenje, košarkaša. and momčadi. 2006). In the last two decades, there has been a significant accumulation of scientific data regarding the physiology and medicine of basketball (Bolonchuk W.W, H.C. Lukaski and W.A. Siders, 1991; Gillam G.M, 1985; Hoffman J.R. et al., 1991; Parr R.B et al.1978;

Soares J et al., 1986; Viviani F and G. Casagrande, 1990; Sergej M et al., 2006). Basketball is a team sport that is planned and must be carried out by each player according to the positional role of the tactics used (Trninik et. al., 2006; Ajay Bhadu & Poonam Singh, 2017). Playing positions in basketball are classified into three groups that reflect a single entity, namely guards, forwards, centers. Furthermore, with the development of rules and tactics, players' positions developed more specifically to become point guard, shooting guard, small forward, power forward, and center (Harris G.R et al., 2000). Modern basketball relies heavily on five different positions as a result of the elaboration of the three outdated group classifications namely guard, forward and center. Applying more specific positions determined by predictive classification models can help coaches to place players in appropriate positions on the pitch (Pion et al., 2018). Each player's position has different fitness and body composition so that even in the training process the coaches have to give different treatment. Guards are the shortest and fastest players on the team who have the best ball control, while centers are the tallest and slowest players on the team (Haris Pojskic et al., 2014).

Recent studies investigating the differences in each player's position show that centers are taller and heavier, and have a higher percentage of body fat (Jelicic et al., 2002; Sallet et al., 2005; Ostojic et al., 2006; Ben Abdelkrim et al. , 2010) than guards and forwards, but guards have better aerobic and anaerobic capacities (Latin et al., 1994; Sallet et al., 2005; Ostojic et al., 2006; Cormery et al., 2008; Ben Abdelkrim et al., 2010), speed and agility (Ben Abdelkrim et al., 2010; Tsitskaris et al., 2003), while forward and center players are better in strength (Ben Abdelkrim et al., 2010; Ostojic et al., 2006; Haris Pojskic et al., 2014). Other studies have shown significant differences between playing positions for body size, speed, agility, vertical jump, maximum oxygen consumption (Hoffman et al., 1996; Sallet 2005; Cormery et al., 2008; Ostojic et al., 2006) found a relationship between body composition, aerobic, anaerobic, and playing positions in basketball. The physical characteristics of an athlete are an important predictive factor of whether the athlete will achieve high performance in the sport they choose (Sallet et al., 2005; Richard Kucsa and Peter Mačura, 2015). The success of an athlete is influenced by several factors. In general, the factors considered to influence the success of an athlete are physical, technical, tactical, and psychological skills. In accordance with the statement that the success of an athlete is influenced by psychological factors (Weinberg & Gould, 2011; Fitri A.N & Dimiyati, 2019).

Anthropometrics, especially height, is one of the factors that coaches consider in recruiting basketball players, especially for the need for positioning players according to the tactics and strategies that will be applied in the game. This diagnosis also indicates whether the player will be

suitable to participate in elite level competition (Hoare. & Warr. 2000; Petrovic. et. al. 2013). Somatic features and body shape profiles of successful basketball players help predict game performance (Bayios. et al. 2006; Ostojic. Mazic. & Dikic. 2006). Positioning of players also tends to be heavily influenced by height characteristics, meaning that position five (center) will be higher than position four (power forward), position three (small forward), position two (shooting guard), and position one (shooting guard). . Position four (power forward) will be higher than position three (small forward), position two (shooting guard), and position one (point guard). Position three (small forward) will be higher than position two (shooting guard), and position one (point guard). Position two (shooting guard) will be higher than (point guard). Delextrat, Anne. & Cohen, Daniel (2009); Bale. (1991); Hoare. (2000) describe centers as significantly taller and heavier than forwards and guards, and forwards as significantly higher than guards. The demands of contemporary basketball are to recruit people who are tall and have long arm spans for center and forward positions, which will be useful when individuals make body contact with opponents, perform offensive and defensive rebounds, block balls, and screen.

Anthropometry (height) in sports is currently widely used, especially in the sport of basketball. But there is still very little research on anthropometrics (height) in basketball, especially after the development of more specific player positions, especially each player's position with five positions. This study tries to reveal the differences in anthropometry (height) for each player's position, namely point guard, shooting guard, small forward, power forward, and center. The main objective of this research is to look at the differences in anthropometry (height) for each player's position.

METHOD

The research method uses a quantitative descriptive design with a retrospective causal comparative design or ex-post facto design. The selection of this research method aims to identify whether there are differences in anthropometry (height) for each playing position of basketball athletes. The subjects of this study were basketball athletes in 27 districts and cities in West Java between the ages of 16 to 18 years. While the samples taken were 20 female players as a result of selection from 27 regencies and cities in West Java who were representatives of every regency and city in West Java. The distribution of the research samples was seven people from Bandung City, two people from West Bandung Regency, one person from Bogor City, four people from Cirebon City, two people from Pangandaran Regency, three people from Bandung Regency, and

one person from Bogor Regency. They are the best athletes from every Regency and City. How to take samples using non-probability sampling technique. Non-probability sampling is a sampling technique that provides unequal opportunities or opportunities for each element or member of the population to be selected as a sample. While the type of non-probability sampling that is used is the quota sampling technique. The instrument used is to measure body height using a Stature Meter. Then the data was recapitulated and analyzed using SPSS software with a one-way ANOVA test.

RESULTS

The results showed that there were differences in anthropometry (height) for each basketball athlete's playing position. These results are presented in Tables 1 and 2.

Table 1. Differences in Average Player Positions Based on Anthropometric Studies (Height)

Anthropometrik				
Tukey HSD ^a				
Subset for alpha = 0.05				
Posisi Bermain	N	1	2	3
Point Guard	4	156.50		
Shooting Guard	4	157.25		
Small Forward	4	161.25	161.25	
Power Forward	4		164.75	
Center	4			177.75
Sig.		.309	.590	1.000

Based on the description of anthropometric data (height), the women's basketball athletes are Point Guard 156.50, while Shooting Guard is 157.25, then Small Forward is 161.25, while Power Forward is 164.75, and Center is 177.75. Then it can be interpreted that in subset 1 there is data on the height of the point guard, shooting guard, and small forward. This means that the three positions do not have a significant difference. Whereas in subset 2 there is data on the height of small forward and power forward. This means that the two positions do not have a significant difference. In subset 3 there is only center height data.

Based on table 2, it is known that the sig. of $0.000 < 0.05$ so that the hypothesis is accepted. So it can be concluded that the average playing position based on anthropometric studies (height) is significantly different.

Table 2. Testing Average Position of Players Based on Anthropometric Studies (Height) ANOVA Analysis
Anthropometrik

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	1191.000	4	297.750	26.585	.000
Within Groups	168.000	15	11.200		
Total	1359.000	19			

DISCUSSION

The results of the research findings by calculating the average test with ANOVA showed that there were differences in the height of each playing position of basketball players. In fact, after testing the average difference from each player's position, it was shown that there were three groups that had differences, namely the point guards and shooting guards were different from the power forwards and small forwards. Did not show a significant difference in height. Small forward with power forward also does not show a significant difference. But even though there was no significant difference, on average there was a difference but according to statistical calculations it was not significant. Each position has its own anthropometric characteristics, position one (point guard) is the shortest player position in terms of anthropometric height compared to position two (shooting guard), position three (small forward), position four (power forward) and position four (power forward). five (centers). Position two or shooting guard is the second shortest player position in terms of height anthropometry compared to position three (small forward), position four (power forward) and position five (center). But position two (shooting guard) is higher when compared to position one (point guard). Position three (small forward) three is taller than position one (point guard) and position two (shooting guard) and shorter than position four (power forward) and position five (center). Position four (power forward) is higher than position one (point guard), position two (shooting guard), and position three (small forward) and is shorter than fifth (center). Position five (center) is the tallest player position in terms of height anthropometry compared to position four (power forward), position three (small forward), position two (shooting guard), and position one (point guard). Hoare. (2000), explained that for height, the point guard is the shortest player while the center is significantly taller compared to players in other positions. Point guards are also significantly shorter than shooting guards and small forwards, while small forwards are shorter than power forwards.

The results showed that there were significant differences in anthropometric skills (height) from each playing position in basketball. Studies on anthropometry, especially regarding playing positions in basketball, are still very limited, but these studies show almost similar results, namely studies that have described the anthropometric characteristics of female basketball players (Bale. 1991; Hoare. 2000; LaMonte. et. al. 1999) and the results of this study agree with previous findings. Centers are indeed significantly taller and heavier than forwards, who are significantly taller than guards, as has been found previously (Bale. 1991; Hoare. 2000). Differences in playing positions show differences in the development of ball possession in basketball. Coaches and players must be aware of the positional demands of each playing position (te Wierike et al., 2015).

CONCLUSION

The results showed that the overall anthropometry (height) of each playing position was significantly different. Center is the highest position compared to other positions, power forward is the second highest position after center, small forward is higher than point guard and shooting guard but shorter than power forward and center, shooting guard is taller than point guard and shorter than small forward, power forward and center, while the point guard is the shortest player compared to other positions.

Conflict of Interest

I declare that this article is the result of research that I conducted on West Java province basketball athletes, and I do not have any interest in compiling this article. This article was compiled only to advance sports, especially basketball.

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