Ashutosh Pathrod
School of Physical Education,
D.A.V.V., Indore, Madhya
Pradesh, India

Ajay Kumar
Professor, School of Physical
Education, D.A.V.V., Indore,
Madhya Pradesh, India

Dr. Vijay Francis Peter
School of Physical Education,
D.A.V.V., Indore, Madhya
Pradesh, India

Anthropometric characteristics of basketball players of Madhya Pradesh

Ashutosh Pathrod, Ajay Kumar and Dr. Vijay Francis Peter

Abstract
The present study was conducted to identify anthropometric characteristics of basketball players of Madhya Pradesh. A total of 33 basketball players in the age range between 18 to 25 years, Were selected from various districts of Madhya Pradesh these study was delimited to related anthropometric characteristics as: weight, standing height, upper body length (sitting height), lower body length, shoulder width, arm span, arm length, arm span height ratio, upper body length-lower body length ratio and BMI (height and weight were measured and BMI was computed). To characterize the data descriptive statistics: mean, standard deviation, range, minimum and maximum variables were used. The findings of the present study shows that anthropometric characteristics like: Standing Height, Longer Arm Span and Longer Lower Body Length might have an influential role in the performance of basketball players. Whereas due to a tall stature Weight and BMI might not influence the Basketball performance as heavy stature may be due to heavy bone and big muscle mass. Anthropometric characteristics like standing height, longer arm span and longer lower body length might have an influential role in the performance of basketball players. Thus the results might help in training-monitoring and players selection.

Keywords: anthropometry, weight, standing height, upper body length (sitting height), lower body length, shoulder width

Introduction
Basketball is a very demanding sport; Performance in basketball depends on many factors, with the most important one being players Anthropometric build. A basketball coach must supervise balanced development of player's physique, visual and motor coordination improvement and development of necessary motor abilities, considering evolutionary processes connected with the pace of growth and maturation of players. Anthropometric measurements, determination of Anthropometric build models, and Anthropometric profiles have recently become fundamental research areas for sports training specialists. Anthropometric profiles of basketball players have been widely recognized as a crucial factor in the selection process and as a performance predictor. Hence, To assess the anthropometric variables; Weight, Standing Height, Upper Body Length (Sitting Height), Arm Span, Shoulder Width, Arm Length of Players. To assess the Arm Span-Standing Height Ratio Upper Body Length –Lower Body Length Ratio of the Players, and assess the BMI of basketball players of M.P. and categorize them into various categories. Researchers thoroughly investigated anthropometric buildup as a common interest. Although anthropometric buildup affects performance in each and every sport, but in some sports like basketball. Taller persons have much more advantage (Mishra m. and Rathore v. 2015) observed that anthropometric characteristics like height, weight, leg length are fructiferous in estimating performance in volleyball. Athlete cannot achieve top performance if the anthropometric characteristics of athlete do not match with the concerned game. Basketball is a unique sport in other sports; specialist or one dimensional player is required ex: football has field goal kickers, baseball has hitters, hockey has goalies but in basketball each player must be total player. Certain playing areas are three point shooting, rebounding and defense and then multiple skill is very important to play basketball like passing, dribbling, shooting, half defense, full courts press defense, zone defense, screening, weaving, drive in etc.

Corresponding Author:
Ashutosh Pathrod
School of Physical Education,
D.A.V.V., Indore, Madhya
Pradesh, India

these skills are similar as performing in handball, Thus in the research work of (Mohamed *et al.* 2009) determines the taller height and limbs are very crucial in determining the performance in handball. Thus which is correlates with basketball.

Methodology

In the present study, sample was drawn by simple random sampling. Due to COVID 19 Lockdown it was not possible to meet the players personally so the researcher has gathered the contact numbers of around 40 Basketball Players of the Madhya Pradesh. These players have been sent the Google Form for collecting the Anthropometric measurement. Body Ratio was calculated by using raw data and some of the variables as Lower Body Length and Arm Length were also calculated using simple formula. Lower Body Length was calculated by subtracting Upper Body Length (Sitting Height) from Standing Height. Whereas Arm Length was calculated by subtracting Shoulder Width from Arm span and divided by 2. BMI was calculated by using formula Weight in Kg divided by Standing Height in Meters Square. To characterize the data descriptive statistics: mean, standard deviation, range, minimum and maximum variables were used.

Table 1: Descriptive Statistics of Weight, Height, Sitting Height, Lower Limb, Shoulder Width, Arm Span and Arm Length

	Weight	Height	Sitting Height	Lower Limb	Shoulder Width	Arm Span	Arm Length
N	33	33	33	33	33	33	33
Mean	72.5455	177.1667	87.5606	89.6061	46.9848	178.9091	65.9636
Std. Deviation	12.22725	6.17033	3.66733	5.61632	4.35977	11.45197	5.00623
Range	50.00	24.00	18.50	23.00	25.00	58.00	25.50
Minimum	50.00	164.00	75.00	77.00	39.00	136.00	48.00
Maximum	100.00	188.00	93.50	100.00	64.00	194.00	73.50

Table 2: Frequency of Arm Span – Standing Height Ratio

Arm Span – Standing Height Ratio		
Condition	Number (N= 33)	Percentage
Longer Arm Span	21	64
Longer Standing Height	9	27
Arm Span = Standing Height	3	9

Table 3: Frequency of Upper Body Length – Lower Body Length Ratio

Upper Body – Lower Body Ratio		
Condition	Number (N= 33)	Percentage
Longer Upper Body	13	39
Longer Lower Body	20	61
Upper Body = Lower Body	0	0

Table 4: Frequency of BMI

BMI		
Condition	Number(N= 33)	Percentage
Under Weight	2	6
Healthy Weight	21	64
Over Weight	10	30
Obese	0	0

Discussion of Findings

It clarifies that Basketball players may vary in their weight as basketball players may need fast and agile action for which low weight is more suitable, tall and heavy players are also seen in the basketball. The finding of height also indicate more or less similar pattern but standard deviation is not much high, it indicates that most of the players are placed near mean. The mean and standard deviation (177.16 ± 6.17) also indicates that players are above average but not tall. It might be due to the fact that a country like India this height is above average and suitable for Basketball Players. The mean and standard deviation of Upper Body Length (Sitting Height) (87.5606± 3.66733) and Lower Body Length (89.6061± 5.61632) also indicates that the mean Lower body Length is slightly higher than Upper Body Length also the highest and lowest score indicates that Lower Body Length is much higher than the Upper Body Length. The Mean and standard deviation of Shoulder Width (46.9848± 4.35977), Arm Span (178.9091± 11.45197), Arm Length (65.9636± 5.00623). And their histogram shows that these characteristics also follow the normal curve where as some extreme scores are also found in these variables. When the Arm Span – Standing Height Ratio is analyzed out of 33, 21 (64%) players are having longer arm span than their Standing Height, whereas 9 (27%) are having longer Standing Height than their Arm Span. Only 3(9%) are having both part equal. This might be the reason that Longer Arm Span might be helpful in shooting skill. When Upper Body Length- Lower Body Length Ratio is analyzed again it is found that out of 33, 20(61%) having longer Lower Body Length where as 13(39%) are having Longer Upper Body Length. Both parts equal are not found in any case. These two finding indicates that basketball player is not only having longer Arm Span but they also have Longer Lower Body part. When BMI is analyzed out of 33, 21(64%) are found in healthy weight category, 10(30%) are found in Over weight category and 2(6%) are found in Under Weight category. Not a single player is found in obese category. This type of finding might be due to tall stature of the player that 10 players are found in over weight category.

Conclusion

The findings of the present study shows that anthropometric characteristics like: Standing Height, Longer Arm Span and Longer Lower Body Length might have an influential role in the performance of basketball players. Whereas due to a tall stature, Weight and BMI might not influence the Basketball performance as heavy stature may be due to heavy bone and big muscle mass of Basketball Players.

References

1. Alejandro V, Santiago S, Gerardo V, Carlos M, Vicente G. Anthropometric Characteristics of Spanish Professional Basketball Players J Hum Kinet. 2015;27(46):99-106.
2. Aychiluhim W, Deyou M. Association of Anthropometric Profile to Speed and Agility Performance in Male Soccer Players. Turkish Journal of Sport and Exercise. 2020;22(1):78-86.
3. Ayuso M, Julio J, Gonzalez C, Vicente J, Clemente Suarez Y, Michael Zourdos C. Influence of anthropometric profile on physical performance in elite female Volleyballers in relation to playing position, Nutr Hosp. 2015;31(2):849-857.

4. Bielec, Grzegorz, Abcdeg, Daniel, Jurak, Bdef. The relationship between selected anthropometric variables and the sports results of early pubescent swimmers. Baltic Journal of Health and Physical Activity, 2019, 95-76.

5. Gabbett T, Jenkins D, Abernethy B. Relative importance of physiological, anthropometric, and skill qualities to team selection in professional rugby league, Journal of Sports Sciences. 2011;29(13):1453-1461.

6. Gryko K, Kopiczko A, Mikołajec K, Stasny P, Musalek M. Anthropometric Variables and Somatotype of Young and Professional Male Basketball Players. Sports (Basel, Switzerland), 2018;6(1):9.

7. Guimarães E, Adam D, Baxter-JonesG, Williams A, Tavares F, Janeira M *et al*. The role of growth, maturation and sporting environment on the development of performance and technical and tactical skills in youth basketball players: The INEX study. Journal of Sports Sciences. 2021;39(9):979-991.

8. Kamala R, Yadav PK. 'Estimation of stature from different anthropometric measurements in Kori population of North India' P.K. Egyptian Journal of Forensic Sciences, 2016, 6.