COMPARATIVE STUDY OF VITAL CAPACITY AND PEAK FLOW RATE AMONG VARIOUS PLAYING POSITIONS IN BASKETBALL

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ABSTRACT

The purpose of this study was to compare the vital capacity and peak flow rate among different playing positions in basketball i.e. guards, forwards and centers. To achieve the purpose of the study forty five male basketball players from four different universities of Madhya Pradesh who have participated in west zone Inter University basketball competition were selected. They were then divided into three different subsamples according to their positional role (guards = 22, forwards = 19 and centers = 14). To measure the vital capacity and peak flow dry Spirometer and peak flow meter were used respectively. To test the significance of the mean difference among the players of various positions namely guard, forward and center, one way analysis of variance was used. As post – hoc test, the Schefee's test was applied. The results revealed that the forwards (540.62 & ±62.55) demonstrated the highest peak flow rate than the guards (474.28 & ±46.19). Further there were no significant differences found in vital capacity among different playing positions in basketball i.e. guards, forwards and centers.

Key Words: *Vital capacity, Peak flow rate, Basketball, Playing positions.*

INTRODUCTION:

Sports evokes experiences that are exclusively human and independent of the changing forms, patterns and customs of a civilization which involve profoundly modifying concepts of our environment..

Basketball has a remarkable level of popularity all over the world with both men and women. The game is physically demanding, requiring players to participate in repeated bouts of intense actions (e.g., sprinting, shuffling, and jumping) separated by short bouts of low-intensity activity (e.g., walking, jogging) and recovery. (As a result, basketball players must draw on many fitness components including muscular power, speed, agility, and anaerobic-power as well as the physiological parameters like aerobic capacity, anaerobic power, vital capacity, peak flow rate and so on. During the basketball game the duration of work may vary from a momentary throw

or a pass to repetitive work that lasts for several hours. Players need to repeat performance of highly intensive work for a particular time combining them with rest intervals. This is predetermined by the various physiological attributes.

Form the research reviews it is evident that there are great physical demands on the functional capabilities of the basketball players. Great physiological demands necessarily influence the anthropological characteristics.

At the highest level of basketball competition, success can be mostly dependent on the recruitment of players with complementary skills who are capable of performing according to the demands of their playing position (Ige & Kleiner, 1998).

Objective: - The objective of the study was to compare the vital capacity and peak flow rate among different playing positions in basketball.

METHODOLOGY:

Selection of subjects: - For the purpose of the study a total of 45 male Basketball players age ranged from 18-25 years, who have represented their team in west zone intervarsity competition from Madhya Pradesh namely Vikram University Ujjain, Barkatullah University Bhopal, Devi Ahilya Vishwavidylaya University, Indore and Lakshmibai National Institute of Physical Education, Gwalior, were randomly selected. The selected subjects were divided into three groups according to their playing positions in their respective teams namely Guard, Forward and Centre.

Selection of variables: - Vital capacity and peak flow rate were selected as the physiological variables.

Statistical analysis: - To compare the vital capacity and peak flow among different basketball playing position one way analysis of variance was used with the help of data analysis software SPSS 20 and the level of significance was set at 0.05.

RESULTS:

Table 1(a)

Descriptive analysis for Vital capacity

	N	Mean	Std. Deviation	Std. Error
Guards	14	4.8143	.57493	.15366
Forwards	16	4.5875	.49379	.12345
Centers	15	4.5800	.54798	.14149
Total	45	4.6556	.53664	.08000

- Table 1(a) reveals that the mean and standard deviation of Vital capacity for the Guards, Forwards and Centers were 4.81 & ±0.57, 4.58 & ±0.49 and 4.58 & ±0.54 respectively.

Table 1(b)

Analysis of variance of vital capacity

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	.512	2	.256	.885	.420
Within Groups	12.159	42	.289		
Total	12.671	44			

Significant at .05 level, F.05 (2, 42) = 3.23

- Table 2 reveals that the F value was in significant as its p- value is 0.420 which was more than 0.05. Thus, the null hypothesis of no difference among the means of the three groups, i.e. guards, forwards and centers may be accepted at 5% level.

Table 2(a)

Descriptive analysis of Peak flow rate

	N	Mean	Std. Deviation	Std. Error
Guards	14	474.2857	46.19595	12.34639
Forwards	16	540.6250	62.55331	15.63833
Centers	15	526.0000	46.26013	11.94432
Total	45	515.1111	58.76077	8.75954

- Table 2(a) reveals that the mean and standard deviation of Peak flow rate for the Guards, Forwards and Centers were 474.28 & $\pm$46.19, 540.62 & $\pm$62.55 and 526.0 & $\pm$46.26 respectively.

Table 2(b)

Analysis of variance of peak flow rate

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	35527.837	2	17763.919	6.410	.004
Within Groups	116396.607	42	2771.348		
Total	151924.444	44			

- Table 2(b) reveals that the F value was significant as its p- value is 0.004 which was less than 0.05. Thus, the null hypothesis of no difference among the means of the three groups, i.e. guards, forwards and centers may be rejected at 5% level.

Table 2(c)

Scheffe's test for peak flow rate

(I) Playing positions	(J) Playing positions	Mean Difference (I-J)	Std. Error	Sig.
Guards	Forwards	-66.33929*	19.26558	.005
	Centers	-51.71429*	19.56297	.039
Forwards	Guards	66.33929*	19.26558	.005
	Centers	14.62500	18.91998	.743
Centers	Guards	51.71429*	19.56297	.039
	Forwards	-14.62500	18.91998	.743

*. The mean difference is significant at the 0.05 level.

- Table 2(c) reveals that the difference between peak flow rate of the guards and that of forwards was significant as the p- value for this mean difference is 0.005 which was less than 0.05. Similarly, the mean difference between peak flow rate of guards and centers was significant as the p – value was 0.039 which was less than 0.05. The difference between peak flow rate of the forwards to that of centers was insignificant as the p-value for this mean difference was 0.743 which was more than 0.05.

DISCUSSION AND CONCLUSION:

It is apparent from the results that there were significant difference found between forwards and guards and centers and guards in the variable peak flow rate. This may be attributed to the reason

that taller players have a larger and broader lung cavities so there scores of peak flow rate were higher than that of smaller counterparts. There was no significant difference found between forwards and the centers in the variable peak flow rate. As discussed above the taller players have high peak flow rate but the similar results of peak flow rate between forwards and centers may be attributed to the lower training state of the centers

No significant difference was found in the vital capacity among different playing position. The insignificant difference in vital capacity among different playing positions maybe due to the better training state of the guards and forwards in comparison to the centers.

It was concluded that the forwards had the highest peak flow rate and guards have the least. There was no significant difference was found in the vital capacity among different playing position.

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