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ANALYSIS OF PEAK EXPIRATORY FLOW RATE OF BASKETBALL PLAYERS WITH SPECIAL REFERENCE TO PLAYING POSITIONS

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Abstract

The purpose of the study was to analyze the peak expiratory flow rate of basketball players with special reference to playing positions. Women Basketball players from Bharathidasan Inter-collegiate Basketball tournament, organized by J.J College of Arts and Science during 2017-18. In this tournament, totally eleven teams were participated. In that eleven teams 60 novice players which include 25 guards, 25 forwards and 10 center and 60 experienced players which include 25 guards, 25 forwards and 10 center were selected as subjects. The peak expiratory flow rate of basketball players was assessed by peak flow meter. The statistical technique includes descriptive statistics and factorial ANOVA. There was a significant difference among novice and experienced players on peak expiratory flow rate of basketball players. Forward players reported high peak expiratory flow rate than the other position players.

Keywords: Peak expiratory flow rate, Basketball Players, Playing Positions.

INTRODUCTION

Basketball is a complex sport in which two teams of twelve players compete for possession of ball and try scoring opportunities. The aim of the game for each team is to defend a goal area while trying to score goals at the opposing end of the court. Each team consists of twelve players of which only five may take the court at any one time during play. The sport has evolved greatly since its inception over a couple of centuries ago. The 'structure' or 'style of play' has undergone rapid changes due to the rule changes since the introduction of the game. The modern game of basketball is played at very high speed that consists of activities of short duration but high intensity during the course of the game. The changing nature of the game both on offensive and defensive system of play and advent of professionalism have led to greater anthropometrical, physiological and psychological demands on the players.

The game of basketball is characterized by frequent starts, stops, and changes of direction, all maintained over a period of time. While a quarter of game play lasts 8 minutes of clock time, an average segment of play may last only 12–20 seconds (Narazaki et al. 2009). However, basketball players have been found to cover about 4500–5000 m (2.8–3.1 mi) during a 40-minute game (Crisafulli et al. 2002). The anaerobic energy systems supply energy for high-intensity, short-duration muscle contractions, and are composed of the ATP/PCr system and anaerobic glycolysis. The first,

ATP/PCr, generates the energy molecule adenosine triphosphate (ATP) from phosphocreatine (PCr) and is dependent on the ability of the muscle to regenerate the PCr molecule. The second, anaerobic glycolysis, relies on glucose derived from muscle glycogen. Overall, the anaerobic energy systems are responsible for success in the large volume of jumps, sprints, accelerations and decelerations that occur during a game (Janeira & Maia, 1998; McInnes, 1995). Research has found that a player will have 1,000 changes of movement patterns, those changes occurring on average every 2 s;6 relying on the ability of the muscle to produce a large amount of energy quickly. It is clear that training the anaerobic energy system is a key to success in the game of basketball.

METHODOLOGY

The purpose of the study was to analyze the peak expiratory flow rate of basketball players with special reference to playing positions. Women Basketball players from Bharathidasan Inter-collegiate Basketball tournament, organized by J.J College of Arts and Science during 2017-18. In this tournament, totally eleven teams were participated. In that eleven teams 60 novice players which include 25 guards, 25 forwards and 10 center and 60 experienced players which include 25 guards, 25 forwards and 10 center were selected as subjects. The peak expiratory flow rate of basketball players was assessed by peak flow meter. The statistical technique includes descriptive statistics and factorial ANOVA.

RESULTS AND DISCUSSION

TABLE-I
DESCRIPTIVE STATISTICS OF PEAK EXPIRATORY FLOW RATE OF NOVICE AND EXPERIENCED PLAYERS AT DIFFERENT PLAYING POSITIONS AMONG BASKETBALL PLAYERS

Level	Position	Mean	SD (\pm)
Novice	Guard	410.84	7.36
	Forward	422.24	16.89
	Center	414.60	8.01
Experienced	Guard	440.36	6.18
	Forward	438.72	6.13
	Center	440.20	5.65

Table – I showed the descriptive statistics — Mean and Standard deviation of novice Guard, Forward

& Center players and experienced Guard, Forward & Center players.

TABLE-II
2 x 3 FACTORIAL ANALYSIS OF VARIANCE FOR PEAK EXPIRATORY FLOW RATE OF NOVICE AND EXPERIENCED PLAYERS AT DIFFERENT PLAYING POSITIONS AMONG BASKETBALL PLAYERS

Source of Variance	Sum of Squares	df	Mean Square	F
Factor 'A' (Level)	14240.444	1	14240.444	149.779*
Factor 'B' (Position)	602.187	2	301.093	3.167*
Factor 'AxB' (Interaction)	1090.927	2	545.463	5.737*
Error	10838.720	114	95.076	--
Total	22004238.000	120	--	--

$F(1,114)=3.924$, $p \leq .05$

$F(2,114)=3.07$, $p \leq .05$

There was a main effect for level of players. Experienced players ($M=439.65$) elicited significantly high peak expiratory flow rate than Novice players ($M=416.21$), at $F(1,114) = 149.779$, $p \leq .05$. There was also a main effect for position of players. Forward were significantly high peak expiratory flow rate ($M=432.10$)

followed by Guard ($M=428.03$) and Center ($M=427.40$) at $F(2,114)=3.167$, $p \leq .05$. Additionally, there was a significant interaction between level and positions, $F(2,114) = 5.737$, $p \leq .05$. The mean values of peak expiratory flow rate for level of players and playing positions were shown in figure I.

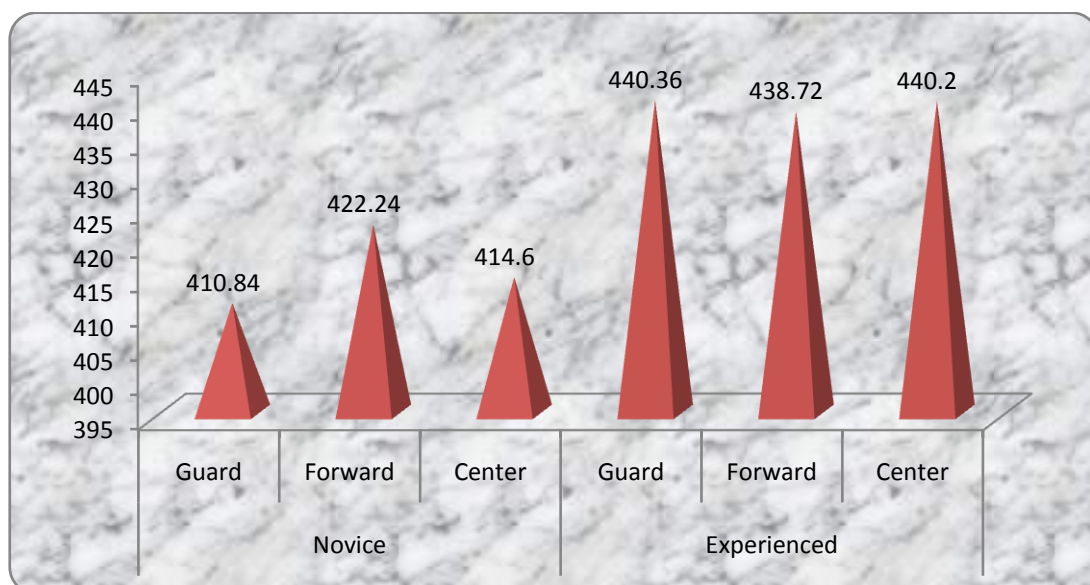


FIGURE – I
SHOWS THE PEAK EXPIRATORY FLOW RATE OF NOVICE AND EXPERIENCED PLAYERS AT DIFFERENT PLAYING POSITIONS AMONG BASKETBALL PLAYERS

TABLE -III
THE SIMPLE EFFECT TEST SCORES OF LEVEL (ROWS) AND POSITIONS (COLUMNS) ON PEAK EXPIRATORY FLOW RATE

Source of Variance	Sum of Squares	df	Mean Squares	Obtained F-ratio
Position within Novice Players	1655.863	2	827.932	8.708*
Position within Experienced Players	37.250	2	18.625	0.196
Level of players within Guard	10892.880	1	10892.880	114.570*
Level of players within Forward	3394.880	1	3394.880	35.707*
Level of players within Center	3276.800	1	3276.800	34.465*
Error	10838.720	114	95.076	

F(1,114) = 3.92, F(2,114) = 3.07 at 0.05 level.

Table above shows that F-ratio values obtained for position within novice players, level of players within guard, level of players within forward and level of players within center were 8.708, 114.570, 35.707 and 34.465 respectively, which was greater than the table value of 3.92 with df 1 and 114 required for significance

at 0.05 level of confidence. The table above shows that the obtained F-ratio value for position within experienced players was 0.196, which was lesser than the table value of 3.07 with df 2 and 114 required for significance at 0.05 level of confidence.

TABLE -IV
THE SCHEFFE'S TEST FOR THE DIFFERENCES BETWEEN PAIRED MEANS OF TESTS ON POSITION WITHIN NOVICE PLAYERS

Means			Mean Difference	Confidence Interval
Guard	Forward	Center		
410.84	422.24	--	11.40*	4.41
410.84	--	414.60	3.76	4.41
--	422.24	414.60	7.64*	4.41

* significant at 0.05 level

There was a difference between Guard & Forward (MD=11.40), and forward & Center (MD=7.64). There was a insignificant difference between Guard & Center (MD=3.76).

CONCLUSIONS

1. There was a significant difference among novice and experienced players on peak expiratory flow rate of basketball players.
2. Forward players reported high peak expiratory flow rate than the other position players.

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