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Peak expiratory flow rate (PEFR) among selected non-contact games

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Abstract
The purpose of the present study was to compare the peak expiratory flow rate among selected national level male non-contact games (volleyball, cricket and baseball players). For the purpose of the study, sixty (N=60) national level male players (twenty for each game) from Chandigarh (UT) were selected as subjects of the study by using purposive sampling technique. The age of the subjects ranged between 19-25 years. To find out the significance differences selected national level male volleyball, cricket and baseball players, one way ANOVA was used with the help of SPSS software. Further Scheffe's post-hoc test was applied to see the direction and significance of differences where 'F' ratio was found significant. The level of significance chosen was .05. Significant difference was obtained on peak expiratory flow rate among selected national level male players. Volleyball players demonstrated significantly better than cricket and baseball players on peak expiratory flow rate.

Keywords: Peak Expiratory Flow Rate, Male players, Volleyball, Cricket, Baseball

Introduction
The peak expiratory flow rate (PEFR) is the maximum flow rate attained during a forced expiration after a maximum inspiration. Physiological variables are very important aspects which determine the work capacity of human organisms. These physiological variables are influenced by some other factors such as environment, working condition, heredity as well as diet. Peak expiratory flow rate has an important effect on performance of an individual. Several factors such as respiratory muscle contractile power, elastic recoil of lung tissue, and airways resistance influence the maximal flow volume curve. Studies reveal that at least 15- 20 per cent of athletes suffer from abnormalities of breathing which place a significant restriction on their ability to undertake endurance work. Usually this is unknown to the individual but in the majority of cases can be corrected if diagnosed. In order athletes the development of lung function improves economy which, in turn, results in better performance.
Daily stretching of the adult lung and respiratory muscles over a 5-week period as occurs during programs of specific respiratory muscle training have been shown to elicit small but significant increase in vital capacity and peak flow. In general, lung volume and capacities change very little as the result of physical exercise. It does appear that vital capacity may increase slightly during maximal exercise, but this may be related to the slight exercise decrease seen in residual volume.

Objective of the Study
The objective of the study was to compare the peak expiratory flow rate among selected national level male volleyball, cricket and baseball players.

Materials and Methods
For the purpose of the study, sixty (N=60) national level male non-contact game players (volleyball=20, cricket=20 and baseball=20) from Chandigarh (UT) were selected as subjects of the study by using purposive sampling technique. Peak flow meter was used to measure the peak expiratory flow rate (PEFR). To find out the significance differences among national level players on peak expiratory flow rate, analysis of variance (ANOVA) was applied with the help of SPSS software. Further Scheffe's post-hoc test was used to see the direction and significances of differences where 'F' ratio was found significant. For testing hypothesis, the level of significance chosen was 0.05.

Fig 1: Illustration of Peak Flow Rate Measurement

Findings

Descriptive analysis of peak expiratory flow rate among national level male volleyball, cricket and baseball players is presented in table-1.

Table 1: Descriptive Analysis of Selected Three Non-Contact Games (Volleyball, Cricket and Baseball) on Peak Expiratory Flow Rate

Variable	Group	N	Mean	Std. Deviation	Std. Error
Peak Expiratory Flow Rate (PEFR)	Volleyball	20	560.50	77.69542	17.37323
	Cricket	20	526.00	47.72730	10.67215
	Baseball	20	506.00	49.35372	11.03583

The Analysis of Variance (ANOVA) among national level male volleyball, cricket and baseball players on peak expiratory flow rate is presented in Table 2.

Table 2: ANOVA of Selected Three Non-Contact Games (Volleyball, Cricket and Baseball) on Peak Expiratory Flow Rate

Variable	Source of Variance	Sum of Squares	df	Mean Square	F	Sig.
Peak Expiratory Flow Rate	Between Group	30403.333	2	15201	**4.242***	.019
	Within Group	2042255.000	57	3583.421		
	Total	234658.333	59			

**Significant at .05 level $F_{.05}(2, 57) = 3.15$*

Table-2 clearly indicates that there was significant difference among national level male volleyball, cricket and baseball players on peak expiratory flow rate since the obtained 'F' values at 0.05 level was 4.242 whereas, value needed to be significant was 3.16. Since the ANOVA was found significant, the Scheffe's post-hoc test was applied to find out which of the difference of the means amongst the group were statistically significant. The data related to this are presented in table-3.

Table 3: Significant Differences between the Paired Means of Peak Expiratory Flow Rate among Different Three Non-Contact Games

Variable	Groups			Mean Difference	Sig.
	Volleyball	Cricket	Baseball		
Peak Expiratory Flow Rate	560.50	526.00		34.50	.074
	560.50		506.00	54.50*	.006
		526.00	506.00	20.00	.295

Table 3 clearly indicates that the significant difference existed between volleyball and baseball on peak expiratory flow rate since the value obtained was 54.50. No significant differences were obtained between volleyball and cricket & cricket and baseball since the values obtained were 34.50 and 20.00 respectively. Mean scores of different three non-contact games on peak expiratory flow rate is graphically depicted in figure-3.

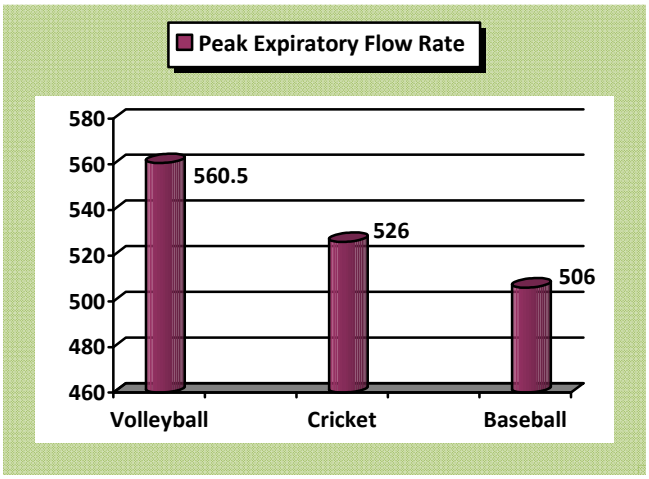

Fig 1: Graphical Representation of Mean Scores of Selected Non-Contact Games (Volleyball, Baseball and Cricket Players) on Peak Expiratory Flow Rate

Discussion of Findings

The finding of the study showed that there was significant difference obtained on peak expiratory flow rate among selected national level male players. Volleyball players demonstrated significantly better than cricket and baseball players on peak expiratory flow rate. It may be attributed to the fact that the body structure of volleyball player is dissimilar when compared with cricket and baseball players. Hence, the three different selected non-contact games were differed significantly.

Conclusions

In the light of the findings and limitations of the present study the following conclusions were drawn:

- Significant difference was found among selected non-contact games (volleyball, baseball and cricket players) on peak expiratory flow rate.
- Volleyball players were performed significantly better on peak expiratory flow rate than their counterparts.

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