



A STUDY ON MINUTE VENTILATION OF DIFFERENT SPORTS PERSONS

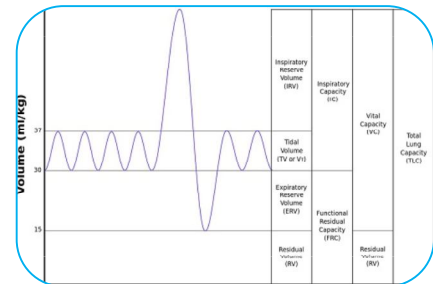
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ABSTRACT

The amount of air we either exhale or inhale in one minute is termed as minute ventilation. It is the product of tidal volume and respiratory rate. The purpose of the study was to examine, analyse and compare minute ventilation among different sports persons. To achieve the purpose of the study 60 subjects were randomly selected from three different sports i.e., Long Distance Runners, Judo and Hockey players who are participated in Inter-University competitions and national levels. In which long-distance runners were 20, judo players were 20 and hockey players were 20. The data was collected with the help of CPET by Breath-to-Breath analysis. The statistical analysis Mean, SD and ANOVA was used for the analysis of collected data. The result found that there was a significant difference among selected groups.



KEYWORDS: Minute Ventilation, Long Distance Runners, Judo Players and Hockey Players.

INTRODUCTION

The amount of air we either exhale or inhale in one minute is termed as minute ventilation. It is the product of tidal volume and respiratory rate. During rest the ventilation ranges between 4-15 L.min.⁻¹. It changes with body size and is smaller in females and larger in males. The minute ventilation increases during the exercise, which is followed by a continued, greater increase in the respiratory rate and tidal volume. During exercise up to near maximal intensities, the minute ventilation increases proportionally with an increase in the metabolic demands of the body. Following training, the maximal ventilation is increased. In other words, training helps in an increased efficiency of ventilation.

The long-distance running is physiologically, aerobic in nature requires stamina as well mental strength. "... Long-distance runners typically perform at around 75–85% of peak aerobic capacity, while short-distance runners perform at closer to 100% of peak" (Zinner et.al., 2015). The lactate threshold capacity in long distance runners is good it is correlate to their performance.

Judo is an unarmed combat sport. Competitive judo demands high-intensity intermittent actions, in which optimal physical attributes are necessary in order to achieve technical-tactical development and success in combat. Actually, high training loads, which require successful and coordinated actions, are applied to judokas in order to achieve high sport's performance.

Hockey has high demands in all three energy systems. The aerobic system is important during prolonged intermittent exercise, and high intensity efforts rely on the anaerobic energy systems, adenosine triphosphate phosphocreatine for the intermediate and anaerobic glycolysis for short term.

OBJECTIVE OF THE STUDY:

To examine and compare the Minute Ventilation (VE) of Long-Distance Runners, Judo and Hockey players.

HYPOTHESIS:

The study was hypothesized that there would be significant difference in Minute Ventilation (VE) among Long-Distance Runners, Judo and Hockey Players.

METHODOLOGY:***Selection of the Subjects:***

The purpose of the study was to compare the Minute Ventilation (VE) of Long-Distance Runners, Judo and Hockey players. To achieve the purpose of the study 60 subjects were randomly selected who are participated in Inter-University competitions and national levels. In which long-distance runners were 20, judo players were 20 and hockey players were 20.

Selection of variables:

The Minute Ventilation (VE) was selected as Variable.

Selection of Equipment:

The CPET unit used to assess the respiratory exchange ratio by Breath-to-breath analysis.

ANALYSIS AND RESULTS:

Descriptive statistics with regard to Minute Ventilation among Long Distance Runners, Judo and Hockey players have been presented in table – 1

Table 1
Mean, SD, Minimum and Maximum values of VE of Long-Distance Runners, Judo and Hockey Players.

Name of the Groups	N	Mean	Std. Deviation	Minimum	Maximum
Long Distance Runners	20	136.10	10.13	120.40	158.20
Judo Players	20	117.52	11.01	98.00	137.10
Hockey Players	20	107.97	21.38	77.00	138.60

The table – 1 depicts the mean and SD values of Long-Distance Runners, Judo and Hockey players with regard to Minute Ventilation as 136.10 ± 10.13 , 117.52 ± 11.01 and 107.97 ± 21.38 respectively. Minimum value of Long-Distance Runners, Judo and Hockey players with regard to Minute Ventilation as 120.40, 98 and 77 respectively. Maximum values of Long-Distance Runners, Judo and Hockey players with regard to Minute Ventilation as 158.20, 137.10 and 138.60 respectively. The graphical representation of mean scores of Minute Ventilation has been depicted in figure – 2.

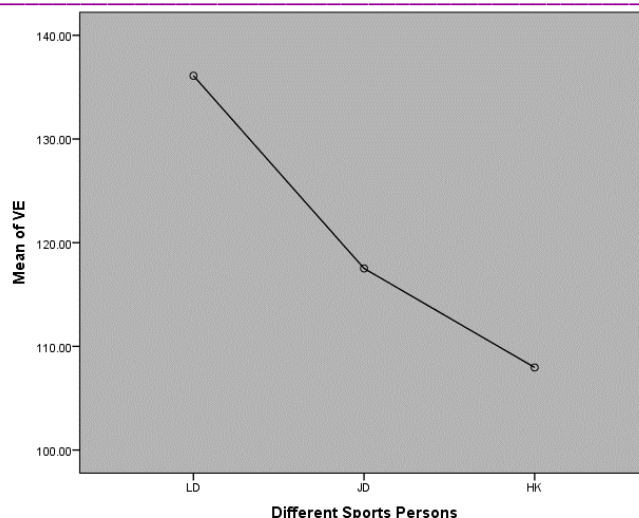


Figure 1- Graphical representation of Mean, Minimum and Maximum values of VE of Long-Distance Runners, Judo and Hockey Players.

Analysis of Variance (ANOVA) results with regard to Minute Ventilation among Long Distance Runners, Judo and Hockey players have been presented in table - 2

Table - 2
Analysis of Variance of VE of Long-Distance Runners, Judo and Hockey Players.

Source of Variance	Sum of Squares	df	Mean Square	F	p-value (Sig.)
Between Groups	8187.886	2	4093.943	18.032	.000*
Within Groups	12940.791	57	227.031		
Total	21128.677	59			

*Significant at 0.05 level

The table 2 describes that statistically significant differences ($p < 0.05$) existed among Long Distance Runners, Judo and Hockey players with regard to Minute Ventilation. Since, the obtained 'F' ratio 18.032 (0.00) was found statistically significant. Therefore, Tukey's Post hoc was applied to find out the degree and direction of differences among selected groups. Result of post hoc test has been presented in table-3.

Table 3
Post hoc analysis of VE among Long-Distance Runners, Judo and Hockey Players.

Groups (I)	Groups (J)	Mean Difference (I-J)	Std. Error	p-value (Sig.)
Long Distance Running	Judo	18.59*	103.06	.001
Judo	Hockey	9.55	4.76478	.120
Hockey	Long Distance Running	28.12*	4.76478	.000

*Significant at 0.05 level

Table 3 explains the mean value of Long-Distance Runners was 136.10 and Judo players was 117.52 with the mean difference of 18.59. The p-value (Sig.) .001 showed ($p < 0.05$) significant differences between both the group on the variable Minute Ventilation. While comparing the mean values, the Long-Distance Runners showed higher Minute Ventilation than Judo players.

The mean value of Judo players was 117.52 and Hockey players was 107.97 with the mean difference 9.55. The p-value (Sig.) .120 showed ($p > 0.05$) no significant differences between both the group on the variable Minute Ventilation. While comparing the mean values the Judo players showed higher Minute Ventilation than Hockey players.

The mean value of Hockey players was 107.97 and Long-Distance Runners was 136.10 with the mean difference 28.12. The p-value (Sig.) .000 showed ($p < 0.05$) significant differences between both the group on the variable Minute Ventilation. while comparing the mean values, the Long-Distance Runners showed higher Minute Ventilation than Hockey players.

DISCUSSION:

Long distance running is a purely aerobic sports, so the mean values of oxygen consumption capacity of players is high as compare to Judo and Hockey players. Hence, the minute ventilation showed high value in Long-distance runners as compare to Judo and Hockey players.

The significance difference found among Long Distance Runners, Hockey and Judo Players related to Minute Ventilation. Hence, the hypothesis was accepted.

CONCLUSIONS:

On the basis of the findings of the study the following conclusions were drawn;

1. Significant difference was observed among Long-Distance Runners, Judo and Hockey Players with respect to Minute Ventilation.
2. Significant difference found between Long-Distance Runners and Judo Players on variable Minute Ventilation.
3. Significant difference found between Long-Distance Runners and Hockey Players on variable Minute Ventilation.
4. There was no Significant difference found between Hockey and Judo Players on variable Minute Ventilation.
5. The Long-Distance Runners showed higher value related to Minute Ventilation followed by Judo and Hockey Players.

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