



# A Comparative Analysis of Respiratory Indices of Throwers: A Foundation for Success

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## Abstract

*Thus the aim of this study was to determine the comparative analysis of respiratory indices of throwers. To obtain data, the investigators had selected Sixty (N=60), male inter-college and inter-university level throwers between the age group of 18-25 years were selected. The subjects were purposively assigned into three groups: Group-A: Throwers (n<sub>1</sub>=60) Inter-College (n<sub>1a</sub>=30) and Inter-University (n<sub>1b</sub>=30). To determine the significant differences of motor fitness components between Inter-College and Inter- University Throwers, unpaired t-test was employed for data analyses. To test the hypothesis, the level of significance was set at 0.05. To concludes, it is significant to mention in relation to Respiratory Indices that insignificant differences occur between Inter-College and Inter-University Throwers on the sub variable Expiratory Reserve Volume (ERV). However, the significant differences occur between Inter-College and Inter-University Throwers on the sub variable Vital Capacity (VC), Tidal Volume (VT), Inspiratory Reserve Volume (IRV) and Inspiratory Capacity (IC).*

**Keywords:** Respiratory Indices, Throwers, Inter-College and Inter-University..

## Introduction

It has been recognized by experts and sports scientists that high level performance in athletics not only requires certain physical qualities like speed, endurance, explosive power, agility, flexibility, strength etc., but also physiological characteristics help him for his better performance. The ability of an individual to perform well in given activity depends on many variables the most significant of which is the magnitude of one's energy supplied and the type of energy needed. Oxygen is continuously required for energy metabolism. The process of gaseous exchange by which oxygen is taken from the environment to the cellular level and carbon dioxide is removed from the body is known as respiration. Respiration is the process of taking environmental air into the lungs (Inspiration) and expelling air from the lungs (Expiration). While the former is an active process, the later is a passive one. When the diaphragm and external internal costal muscles contract, the vertical and anteroposterior diameter of the thoracic cavity is increased. This causes decrease in intrapleural pressure which allows lung to expand. When the volume of lungs increases, the pressure inside the lungs drops. Pulmonary ventilation is generally known to have a linear relationship with oxygen consumption at different levels of exercise. Oxygen consumption is also known to increase the resting state and intense exercise. Lung function parameters tend to have a relationship with lifestyle such as regular exercise and non- exercise<sup>1</sup>. Due to regular exercise, athletes tend to have an increase in pulmonary capacity when compared to non-

exercising individuals, especially when the exercise is strenuous. This Ventilatory adaptation to exercise may differ in different populations such as in Black and Caucasian subjects particularly under different climatic conditions i.e. it may be related to ethnic and environmental factors<sup>2</sup>. Conducted a study on the effect of chronic exercise on lung function and basal metabolic rate in some Nigerian athletes. Results from the study showed that TV and FVC, but not FEV were significantly higher in male athletes than in male non-athletes. TV, FVC and FEV were not significantly different in the two female groups. From the literature it is clear that physiological fitness is differs in athlete and non-athletes, it differs according to level of competitions<sup>3</sup>. Therefore, in the present study the investigator intends to find out the differences in respiratory indices i.e. vital capacity, forced vital capacity, tidal volume, Inspiratory reserve volume, expiratory reserve volume and Inspiratory capacity of sprinter, throwers and jumpers.

## Methodology

**Selection of subjects:** For the purpose of the present study, Sixty (N=60), Male Inter-College and Inter-University Level Throwers between the age group of 18-25 years were selected. The subjects were purposively assigned into three groups: Group-A: Throwers (n<sub>1</sub>=60). Inter-College (n<sub>1a</sub>=30) and Inter-University (n<sub>1b</sub>=30)

**Selection of Variables:** A feasibility analysis as to which of the variables could be taken up for the investigation, keeping in

view the availability of tools, adequacy to the subjects and the legitimate time that could be devoted for tests and to keep the entire study unitary and integrated was made in consultation with experts. With the above criteria in mind, the respiratory indices were selected for the present study:

**Respiratory Indices:** Vital Capacity (VC), Tidal Volume (VT), Expiratory Reserve Volume (ERV), Inspired Reserve Volume (IRV), Inspiratory Capacity (IC).

**Statistical Technique Employed:** To determine the significant differences of respiratory indices between Inter-College and Inter- University Throwers, unpaired t-test was employed for data analyses. To test the hypothesis, the level of significance was set at 0.05.

### Results and Discussion

The results of Respiratory Indices of Inter-College and Inter-University level Throwers are presented in the following tables and their interpretations are given accordingly. Graphical representation of each variable is also presented for mean comparison. Further discussion of finding is initiated for better understanding of results.

**Vital Capacity (VC):** A glance at table-1 shows the results of Inter-College and Inter-University throwers with regard to respiratory indices. The descriptive statistics shows the Mean and SD values of Inter-College throwers on the variable of Vital Capacity (VC) as 4.1730 and .25821 respectively. However, Inter-University throwers had Mean and SD values as 4.5153

and .28135 respectively. The 't'-value 4.910 as shown in the table above was found statistically significant ( $P < .05$ ).

**Tidal Volume (VT):** The descriptive statistics shows the Mean and SD values of Inter-College throwers on the variable of Tidal Volume (VT) as .4837 and .06785 respectively. However, Inter-University throwers had Mean and SD values as .5370 and .05885 respectively. The 't'-value 3.253 as shown in the table above was found statistically significant ( $P < .05$ ).

**Expiratory Reserve volume (ERV):** The descriptive statistics shows the Mean and SD values of Inter-College throwers on the variable of Expiratory Reserve Volume (ERV) as 1.2437 and .21348 respectively. However, Inter-University throwers had Mean and SD values as 1.3310 and .16306 respectively. The 't'-value 1.781 as shown in the table above was found statistically insignificant ( $P > .05$ ).

**Inspiratory Reserve volume (IRV):** The descriptive statistics shows the Mean and SD values of Inter-College throwers on the variable of Inspiratory Reserve Volume (IRV) as 2.4457 and .28255 respectively. However, Inter-University throwers had Mean and SD values as 2.6473 and .22649 respectively. The 't'-value 3.050 as shown in the table above was found statistically significant ( $P < .05$ ).

**Inspiratory Capacity (IC):** The descriptive statistics shows the Mean and SD values of Inter-College throwers on the variable of Inspiratory Capacity (IC) as 2.9293 and .28666 respectively. However, Inter-University throwers had Mean and SD values as 3.1843 and .24886 respectively. The 't'-value 3.679 as shown in the table above was found statistically significant ( $P < .05$ ).

**Table-1**  
**Significant Differences in the Mean Scores of Inter-College and Inter-University Throwers on the Variable Respiratory Indices**

| Variables                        | Mean          |                  | SD            |                  | Mean Difference | t-value | p-value |
|----------------------------------|---------------|------------------|---------------|------------------|-----------------|---------|---------|
|                                  | Inter-College | Inter-University | Inter-College | Inter-University |                 |         |         |
| Vital Capacity (VC)              | 4.1730        | 4.5153           | .25821        | .28135           | .34233          | 4.910*  | .000    |
| Tidal Volume (VT)                | .4837         | .5370            | .06785        | .05885           | .05333          | 3.253*  | .002    |
| Expiratory Reserve Volume (ERV)  | 1.2437        | 1.3310           | .21348        | .16306           | .08733          | 1.781   | .080    |
| Inspiratory Reserve Volume (IRV) | 2.4457        | 2.6473           | .28255        | .22649           | .20167          | 3.050*  | .003    |
| Inspiratory Capacity (IC)        | 2.9293        | 3.1843           | .28666        | .24886           | .25500          | 3.679*  | .001    |

\*Significant at 0.05 level,  $t_{.05} (58)$

## Conclusions

Based on the findings of this study, the following conclusions were drawn: To concludes, it is significant to mention in relation to Respiratory Indices that insignificant differences occur between Inter-College and Inter-University Throwers on the sub variable Expiratory Reserve Volume (ERV). However, the significant differences occur between Inter-College and Inter-University Throwers on the sub variable Vital Capacity (VC), Tidal Volume (VT), Inspiratory Reserve Volume (IRV) and Inspiratory Capacity (IC).

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