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## Research Article

# COMPARATIVE STUDY OF LUNG CAPACITY IN DIFFERENT AGE GROUPS IN AND AROUND SATARA CITY

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### ABSTRACT

Lung capacity is total amount of air that is breath out after taking a deep breath. Lung capacity usually depends on human age, sex, size, health, height, ethnicity and geographical location. The lung capacities are measurement of two or more volumes. When breathing in air (Inhalation), the lungs fill up with air from which oxygen is extracted. When exhaling, air is released from lungs in the form of carbon dioxide. Lung capacity of 50 peoples (25 males and 25 females) of different age groups was calculated by using peak flow meter. The lung capacity varied according to age factor.

#### Key Words:

Peak flow meter, vital lung capacity, functional residual capacity, inspiratory capacity

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## INTRODUCTION

Pulmonary or lung function test are simple and safe investigation used in clinical practiced for diagnosis of different respiratory diseases. The most tests include peak flow meter. The amount of air held by lungs is lung capacity. Alveoli are small air sacs attached to our lungs that filled with air and allow lungs to expand and contract. Red blood cells that cycle through the lungs take oxygen from the lungs and distribute it throughout the body. Results of these tests can help doctor to examine whether a person suffers from breathing disorders.

Four standard lung volumes namely, Tidal Volume (TV), it is volume of air breathed in and out during normal, relaxed breathing. The Inspiratory Reserved Volume (IRV), the air that can be forcibly inhaled after the inspiration of the normal tidal volume. The Expiratory Reserved Volume (ERV), the air that can be forcibly exhaled after the expiration of normal tidal volume. Residual Volume (RV), volume of air still remaining in the lungs after the expiratory reserved volume is exhaled. Alternatively, standard lung capacities are Inspiratory Capacity (IC), is the maximum amount of air that can be inspired. Functional Residual Capacity (FRC), is the amount of air remaining in lungs after normal expiration. Vital Capacity (VC), is the total amount of air that can be expire after fully

inhaling. Total Lung Capacity (TLC), is the maximum amount of air that can fill the lungs.

## MATERIAL AND METHODS

**Target group:** 50 peoples in 5 different age group

Male- age group 1: 8 to 12 years, age group 2: 13-20 years, age group 3 : 21- 30 years, age group 4: 31-40, age group 5: 31-40 years

female- age group 1: 8 to 12 years, age group 2: 13-20 years, age group 3 : 21- 30 years, age group 4: 31-40, age group 5: 31-40 years

**Peak flow meter:** very simple device for measuring lung capacity are becoming popular. One such device is called Peak flow meter. It is device, to measure lung capacity and flow volume. A peak flow meter is portable, inexpensive, hand held device used to measure how air flows from lungs in one "fast blast". In other words the meter measures your ability to push air out of lungs.

**Peak flow test:** 1) Take a deep breath and fill lungs all the way.

1. Hold breath while place the mouthpiece in mouth.
2. Close lips around it and blow out.
3. Note down result.

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**Procedure**

1. An instrument required for lung capacity called peak flow meter or spirometer was used.
2. The pointer of peak flow meter was set to zero.
3. The subject was allowed to sit in straight position and breath deep.
4. It was made sure, subject to not insert tongue inside mouth piece.
5. Breathing out was done as fast as possible.
6. The value was considered and the pointer was set to zero again.
7. Breathing procedure was carried out again for two times.
8. Reading was noted down.
9. Average reading was considered after the procedure.

**OBSERVATION AND RESULTS**

**Table** Mean of lung capacity test for the subjects of different age groups

Variables	8-12 years	13-20 years	21-30 years	31-40 years	41-50 years
Male	158 L/min	307 L/min	622 L/min	523 L/min	428 L/min
Female	132 L/min	226 L/min	499 L/min	475 L/min	386 L/min

Mean of lung capacity test for the subjects of different age groups

In present study we observed that, the lung capacity of female lungs is less as compare to the lung capacity of males who are of the same age group. In this study, we observed that the lung capacity is different in age groups. As aging occurs, the lung capacity goes on decreasing.

**DISCUSSION**

Our study suggested that male and females of same age have different lung capacity. Similarly Rakesh kumar and et. al. reported that values of lung capacity different in age groups. As well as reported differences in respiratory patterns of healthy adults and the elderly, suggesting that age impact on lung functions.

Pulmonary functions remain the major biology variable that is affected by ageing. Extend in the ageing process in the lungs shows great inter individual variations (Thurlbeck and Wright-1999). Even in individuals who enjoy apparently good health, there are measurable decrements in function of the respiratory system with age (Campbell 2008).

The Mean value of lung capacity in males is higher than females as male have higher percentage of muscle mass and lower percentage of fat, muscle have higher percentage of oxygen requirements than females. Physiological factors that influence lung volumes or capacities include age, gender, weight, height and ethnicity, physical activity, altitude, and others, which should be consider while interpreting result of peak flow meter. Likewise, the quality and accuracy of the test used for estimation of lung volumes or capacities should be considered before interpretation.

Culver and Butler reported that lung function does not necessarily decline in the linear fashion, once throughout from age 18-20 years. Rather it may reach a maximum in the late 20 years and then decline but there is variability in older adult hood, depending on lung capacity at the time of lung maturation. Similarly ours study concluded the mean value of lung capacity decreases slightly after age of 30 years. Kundson et. al. shows that lung function decline throughout life, even in healthy person but decline may go fast after age of 70 years.

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