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## A study to assess the level of knowledge regarding spirometry usage among physiotherapy students in NMCH, Nellore

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### Abstract

**Background:** Spirometry derived from the Latin words SPIRO means to breathe and METER means to measure is a medical test which provides diagnostic information to assess a patient's lung function. It is a reliable method of differentiating between obstructive airways disorders e.g. COPD, asthma and restrictive diseases (where the size of the lungs is reduced, e.g. fibrotic lung disease). Spirometry is the most effective way of determining the severity of COPD. Other measures such as the MRC dyspnoea scale and quality of life assessment forms a more complete picture.

**Objective:** To assess the level of knowledge regarding usage of spirometry among physiotherapy students at NMCH, Nellore.

**Materials and Methods:** Descriptive cross sectional design and convenient sampling technique was used; sample size of the study was 30. Data was collected using structured questionnaire. Data analysis was done with SPSS.

**Results:** Shows that with relation to the level of knowledge regarding usage of spirometry among physiotherapy students, 2(6.6%) had A grade, 4(13.3%) had B+ grade, 15(50%) had B grade, 6(20%) had C grade, 3(10%) had D grade.

**Conclusions:** The findings of the study conclude that majority of the physiotherapy students had B grade knowledge on usage of spirometry. This results strongly suggest that there is an emerging need to educate physiotherapy students regarding usage of spirometry and importance, different methods and the usage of spirometry. To identify the respiratory problems in early stage.

**Keywords:** Spirometry, Bronchial asthma, Dyspnoea

### Introduction

Spirometry derived from the Latin words SPIRO means to breathe and METER means to measure is a medical test which provides diagnostic information to assess a patient's lung function. It is a reliable method of differentiating between obstructive airways disorders e.g. COPD, asthma and restrictive diseases (where the size of the lungs is reduced, e.g. fibrotic lung disease). Spirometry is the most effective way of determining the severity of COPD. Other measures such as the MRC dyspnea scale and quality of life assessment forms a more complete picture. Severity cannot be predicted from clinical signs and symptoms alone.

The spirometer was originally invented in the 1840's by John Hutchinson an English surgeon. In 1679 Borelli became the first to measure the amount of air entering the lungs. Spirometry usage which help to improve to health status and prevent and treat complication from end stage lung disease, and reduce mortality for COPD. Giovannin Alfonso Barelli (1608-1679) had a volunteer plug his nose to assure an accurate measurement of lung volumes and to prevent air from escaping or entering from the nose and believed to be the first person to have a patient block the nose a technique that is still done to this day during spirometry testing.

Basic forced volume vital capacity (FVC) test varies slightly depending on the equipment used, Importance of spirometry is a physiological test measuring exhaled volume of air as a function of time. It is of irreplaceable value as a test of respiratory health in the same way that ECG and BP provide important information about general cardiovascular health. Spirometry gives an objective measurement of lung mechanics to help make or exclude a diagnosis, cannot be made on the basis of spirometry alone.

The procedure of spirometry is the basic forced volume vital capacity test varies lightly depending on the equipment used. Generally, the patient is asked to take the deepest breath they can, and then exhale into the sensor as hard as possible, for as long as possible, preferably at least 6 seconds. It is sometimes directly followed by a rapid inhalation in particular when assessing possible upper airway obstruction. Sometimes, the test will be preceded by a period of quiet breathing in and out from the sensor (tidal volume), or the rapid breath (forced inspiratory part) will come before the forced exhalation. During the test, soft nose clips may be used to prevent air escaping through the nose. Filter mouthpieces may be used to prevent the spread of microorganisms.

The limitations of spirometry included that, the maneuver is highly dependent on patient cooperation and effort, is normally repeated at least three times to ensure reproducibility. The results are dependent on patient cooperation, FVC can only be underestimated, never over estimated. Spirometry test is suitable only for above 6 years of age and conscious patients, this test is not suitable for patients who are unconscious, heavily sedated, or have limitations that would interfere with vigorous respiratory efforts. Other types of lung function tests are available for infants and unconscious persons.

**Objectives**

- To assess the level of knowledge regarding spirometry usage among physiotherapy students.
- To find out the association between the level of knowledge regarding spirometry usage among physiotherapy students with their selected socio demographic variables.

**Materials and methods**

**Sampling and data collection:** Descriptive cross-sectional design, used to assess the level of knowledge regarding spirometry usage among physiotherapy students. NMCH, Nellore. Non-probability convenient sampling was used. Who were available during data collection and voluntarily willing to participate in the study. Who are sick, who are on leave were excluded. Prior Permission was obtained from ethical clearance committee Participants signed an informed consent and were told they could withdraw from the study at any time for any reason.

**Description of tool**

**Part-I:** It Deals with socio demographic variables age, gender, educational level, source of information.

**Part-II:** It consists of 25 structured questionnaire in multiple choice question format to assess the level of knowledge regarding usage of spirometry among physiotherapy students. Each correct answer is given score of 1 and wrong answer is given 0 score.

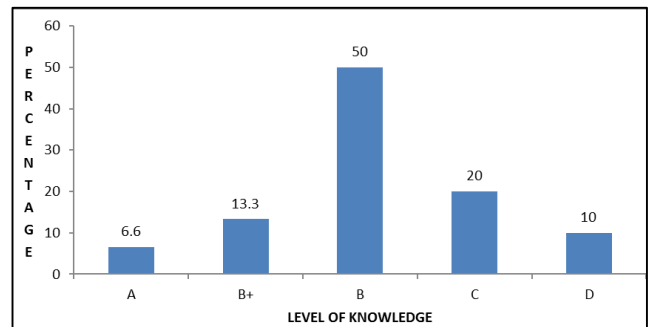
**Score Interpretation**

The score was interpreted as follows:

Grade	Score
A+	More than 85%
A	More than 75%
B+	More than 65%
B	More than 55%
C	More than 50%
D	Less than 50%

**Data analysis:** Data was analysed by using descriptive and inferential statistics. Frequency, percentage, mean, standard deviation and chi-square test were done.

**Results:** The results show that frequency and percentage distribution with refers to age of physiotherapy students, 15(50%) are between the age group of 18-20 years, 13(43.4%) are between the age group of 21-22years, 1(3.3%)are between the age group of 23-24 years,1(3.3%) are between the age group of above 24 years., physiotherapy students gender, 6(20%) are male, 24 (80%) are female. pertaining to education level, 5(16%) are 1<sup>st</sup> year, 11(36.7%) are 2<sup>nd</sup> year 1(3.3%) are 3rd year, 13(43.3%) are 4<sup>th</sup> year. Source of information, 1(3.3%) gained from curriculum, 29(96.7%) are from clinical experience.



**Fig 1:** Percentage distribution of level of knowledge regarding usage of spirometry among physiotherapy students.

**Discussion:** The discussion of the present study was based on the findings obtained from the descriptive and inferential statistical analysis of collected data. It is presented in the view of the objectives of the study. The study related to level of knowledge regarding usage of spirometry among physiotherapy students, 2(6.6%) had A grade, 4(13.3%) had B+ grade, 15(50%) had B grade, 6(20%) had C grade, 3(10%) had D grade.

For physiotherapy students, results Shows that with regard to association of level of knowledge regarding usage of spirometry among physiotherapy students and with their selected demographic variables. There was significant relationship with gender and education level at p=0.05 level and there is no significant relationship with other socio demographic variables like age and source of information.

**Conclusion**

The findings of the study conclude that majority of the physiotherapy students had B grade knowledge on usage of spirometry. This results strongly suggest that there is an emerging need to educate physiotherapy students regarding usage of spirometry and importance, different methods and the usage of spirometry. To identify the respiratory problems in early stage.

**Recommendations**

- The study can be replicated in a large sample in different settings.
- An experimental study can be conducted using control and experimental group.
- A study can be conducted to assess the knowledge and practice of physiotherapy students.

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