

A study to evaluate the Effectiveness of Spirometry on Lung capacity of Post Covid -19 patients admitted in People's hospital Bhopal (M.P.)

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INTRODUCTION

Corona-virus disease 2019 (COVID-19) is defined as illness caused by a novel corona-virus called severe acute respiratory syndrome corona CA-virus 2 (SARS-CoV-2; formerly called 2019-nCoV), which was first identified amid an outbreak of respiratory illness cases in Wuhan City, Hubei Province, China. It was initially reported to the WHO on December 31, 2019. On January 30, 2020, the WHO declared the COVID-19 outbreak a global health emergency. On March 11, 2020, the WHO declared COVID-19 a global pandemic, its first such designation since declaring H1N1 influenza a pandemic in 2009.

Illness caused by SARS-CoV-2 was termed COVID-19 by the WHO, the acronym derived from "Corona-virus disease 2019." The name was chosen to avoid stigmatizing the virus's origins in terms of populations, geography, or animal associations.

COVID-19 can cause lung complications such as pneumonia and in the most severe cases, Acute respiratory distress syndrome or ARDS, and Sepsis are another possible complication of COVID-19 including acute cardiac injury. These condition can also cause lasting harm to the lungs and other organs. While most people recover from pneumonia without any lasting lung damage, pneumonia associated with COVID-19 can be severe. Even after the disease has passed, lung injury may result in breathing difficulties that may take months to improve.

Spirometry is one among the most important and widely used thing in the clinical practices as it helps to provide detailed and easy interpreted information on pulmonary function. it can be a part of routine examination of respiratory status of lung capacity in the patient with pulmonary disease. An Incentive spirometer is a handheld device which helps to increase lung capacity and reduce accumulation of fluid through breathing slowly, It helps to inflate lungs fully and increase strength and reduce chances of developing lung infections.

Objectives:-

1. To assess pretest lung capacity of Post Covid 19 patients admitted in People's hospital, Bhopal
2. To provide spirometry to Post Covid 19 patients admitted in People's hospital, Bhopal (M.P.)
3. To assess post-test lung capacity of Post Covid 19 patients admitted in People's hospital, Bhopal (M.P.)
4. To compare the difference between pre-test lung and post test lung capacity of Post Covid 19 patients admitted in People's hospital, Bhopal (M.P.)

Hypotheses

H0:-There will be no significant difference between pretest and post-test lung capacity of post Covid 19 patients admitted in People's hospital Bhopal (M.P.)

H1:- There will be significant difference between pretest and post-test lung capacity of post Covid 19 patients admitted in People's Hospital Bhopal (M.P.)

Method: A study to evaluate the Effectiveness of Spirometry on Lung capacity of Post Covid 19 patients admitted in People's hospital Bhopal (M.P.) Assessment of the participant fulfilled the inclusion and exclusive criteria were selected. The Purposive sampling technique was used to select 30 samples. The researcher explained the purpose of the study to the patient, patient relative and caregiver. Everyday 3-4 patient were selected based on the severity.

Demographic variable and pretest was done to assess the lung capacity of the patients.

Intervention In group, the intervention of Spirometry was taught to the post-Covid and made them to perform Spirometry exercises daily for 15 minutes for days. The researcher asked the patient to inhale deeply from the lungs and exhale fully through the pipe attached to Spirometry in order to raise the colour ball indicator initially for 15 minutes. The patient was observed by the researcher in every session.

Post-test On 21st day the researcher did post-test to assess the lung capacity among patient. On the discharge, the researcher educated about spirometry and encouraged to practice regularly to improve the lung function. The data were collected and analyzed by using descriptive and inferential statistics.

The data pertaining to lung capacity was collected using self administered questionnaire and respiratory assessment and lung capacity including forced expiratory volume and forced vital capacity and the ratio percentage of fev1/fvc were done using spirometry. Among 30 patients, 10 (33.33%) patients have mild lung capacity, 08 (26.66%) patients had moderate lung capacity, 12 (40%) patients had severe lung capacity score before the implementation of spirometry whereas after the implementation of spirometry, maximum number 39(97.5%) has attained normal lung capacity those who attain moderate category in American thoracic society scale got normal lung

RESULT

Section A: Major finding of demographic variables.

For Socio-demographic Variables distribution of subjects according to age was that the maximum subjects 12 (40%) were in between above 20-30 and 31-40 years of age and 06 (20%) were in 41-50 years of age.

With regard to gender out of 30 Post Covid-19 Patients, it was found that majority 17 (56.66%) were males and 13(43.33%) patients were females.

Distribution of subjects according to type of diet showed that majority 16 (53.33%) were vegetarian, 14 (46.66%) were non vegetarian.

In relation to the occupation, 02 (20%) patients had Occupation in government where as 28 (80%) patients does have Occupation in non-government sector.

In Relation to Educational status,11 (36.66%) Patients had Primary education, 10 (33.33%) had Secondary education, 07(23.33%) were having Graduate,02 (6.66%) were having postgraduate.

Distribution of subjects with regard to marital status ,majority of 22 (73.33%) were Married, 6 (20%) were Unmarried and 02 (6.66%) were divorced.

With regard to occurrence of disease, it was found that the maximum, 04 (13.33%) were suffered with any previous disease, 26 (86.66%) were not suffered with any previous disease, 0 (0%) were in specify.

Distribution of subjects with regard to habit 06 (20%) have the habit of chewing tobacco, 05 (16.66%) have the habit of Alcohol intake and 07 (23.33%) were smokers and 12 (40%) patients had other habits than smaking, Alcohol and chewing tobacco.

In relation to the religion out of 30 Post Covid-19 Patients,18 (60%) were in Hindu, 04 (13.33%) were in Christian, 05 (16.66%) were in Sikh, 03(10%) were in Muslim.

Represents that among 30 Post Covid-19 Patients, all had RT-PCR negative at the time of study capacity and some of them attain increased lung capacity rather than being in moderate category. Those who were placed in severe category got placed in moderate category after implementation of spirometry.

B.The study to assess the pre-test and post-test lung capacity of Post Covid 19 patients admitted in People's hospital,Bhopal (M.P.).

The analysis of Pre-test had respiratory distress and Pre-test mean and SD were 67.02 & 6.2685 and the Post test had no respiratory distress. Post test mean and SD were 81.7 and 1.6763 , t- Test value 12.3914 tabulated value 2.0017.

SECTION C

C. Analysis of effectiveness of incentive spirometry in post Covid 19 patients Analysis of effectiveness of Incentive Spirometry in post Covid- 19 patients .

Table 1: Distribution of Analysis of difference Pre-test and Post-test score of patient with Post Covid 19 disease admitted in People's hospital Bhopal (M.P.) according to Mean & Standard deviation.

	Mean	SD	T-test value	df	Tabulated value	Significant
Pre test	67.02	6.26	12.39	58	2.00	Significant at P value 0.05
Post test	81.7	1.67				

Pre-test mean and SD were 67.02 & 6.26 and the Post test had no respiratory distress. Post test mean and SD were 81.7 and 1.67, t-Test value 12.39 tabulated value 2.00.

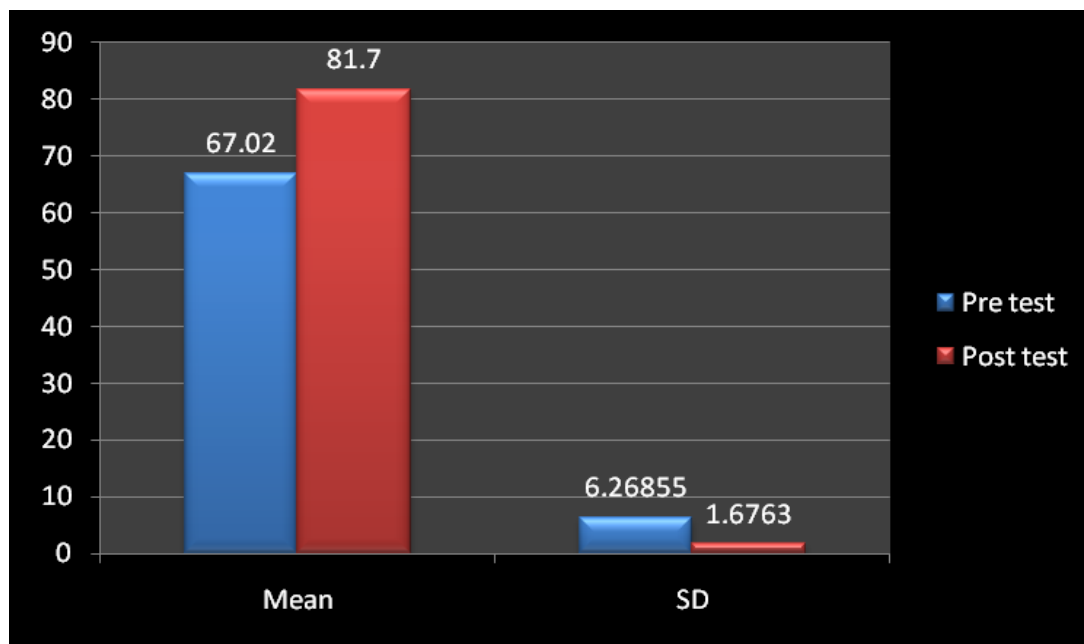


Fig 1: Bar diagram representing Pre-test and Post-test score .

CONCLUSION

The study was done to evaluate the Effectiveness of Spirometry on Lung capacity of Post Covid 19 patients admitted in People's hospital Bhopal (M.P.)

Following conclusion are drawn from the present study findings

- Lung capacity of post covid 19 patient increases after using incentive spirometry.
- Pre-test mean and SD were 67.02 & 6.2685 respectively where as post test mean SD were 81.7 & 1.6763, with t-test value of 12.3914 and tabulated value at 2.0017 These reading indicate the effectiveness of spirometry on enhancing lung capacity of post covid19 admitted in People's hospital .

IMPLICATIONS

Based on the findings of the present study implications for nursing practice are stated below:

Nursing Implication

The researcher has derived the following implication from the study results, which are of vital concern to the field of nursing service, nursing administration, nursing education and nursing research.

- Nursing practice regarding effective use of spirometry in enhancing lung capacity.
- Health education department can arrange health education programmers for teaching the patients correct use of spirometry ,its duration for use and interval to perform within a day
- Nursing practice, nursing education, nursing administration and nursing research, by assessing a level of students knowledge regarding recent advancement in treatment of respiratory diseases.³²

- Nurses should demonstrate the procedure to use spirometry and re demonstration can be taken in order to check the effectiveness of teaching.

Nursing Education

- ❖ Nursing must be encouraged to utilize their knowledge on promoting measure by health education and demonstration in hospital .
- ❖ Nursing education is developing rapidly in India and nurse from india can be found all over the world providing care and education. The present study has implication on nursing education.
- ❖ The findings of the study indicated that more emphasis should be placed in the nursing curriculum on Spirometric practices
- ❖ Periodically awareness programme for using devices like Incentive Spirometry should be arranged for nursing students which would be a great help for promoting themselves as well as other who are in need.
- ❖ Nurse as an educator plays a major role in educating the nursing student regarding recent advancement in treatment for respiratory disease, this knowledge can help students to know about the recent advancements in treatment of respiratory disorder with this knowledge they can explain to patients suffered with respiratory disorder and nurses in clinical area about the recent treatment in dealing with respiratory disorder, So the nurse educator must be educated knowledge regarding recent advancement in treatment in respiratory disorder and its strategies in order to impart the knowledge to patients.
- ❖ Nurse educators should provide opportunities to gain knowledge and skills regarding recent advancement in treatment of respiratory disorder.

Nursing Administration

- Administrators should take initiative action to update the knowledge of nursing personnel regarding breathing exercise in improvement of lung function and reducing the sign of respiratory illness by in service education.
- Nurse administrators can conduct workshop and seminar on breathing exercise for lower respiratory tract to all level of nursing personnel in the hospital.

Nursing Research

Evidence based practice helps the nurses to enrich them in knowledge and practice. Nursing researcher should be directed to toward exploring the advantages of spirometry so that the lung capacity can be enhanced.

The present study revealed that there the practice of spirometry should be encouraged in order to increase the lung capacity of post covid-19 patients. The findings of the present study shall provide a baseline data for research studies to be conducted in future.

Limitation

- Study sample is limited to 30 patients.
- The study is limited only to post Covid-19 patients those who are admitted in People's hospital Bhopal.
- The present study is limited to only one group; no control group adopted for the study.
- Limited time was available for the study.

Recommendations

The following studies can be undertaken to strengthen spirometry exercise as a good remedy for enhancing lung capacity in post covid 19 patients.

- ❖ The same study can be replicated on a larger sample and also at different settings for generalization of findings.
- ❖ A study can be conducted with more than ten days intervention.

Key words: Post Covid, Standard deviation, Spirometry, lung capacity, forced expiratory volume, Covid-19, RT-PCR .