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Assessment of respiratory outcome among patients with lower respiratory tract disorders

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Abstract

Lower Respiratory Tract Disorders are a persistent and a pervasive health problem which impose an enormous burden on the society. Lower respiratory tract disorders are a substantial public health problem and a leading cause of illness and death in people of all ages. The burden of Lower Respiratory Tract Disorders is highest in areas of low socio-demographic status, population that depends on solid fuels for cooking and heating, and in malnourished and immune impaired population. Hence, this study was proposed to assess the respiratory outcome using various clinical parameters and to correlate with the selected demographic variables.

Aim: The aim of this study was to assess the respiratory outcome of patients with Lower Respiratory Tract Disorders and to associate the respiratory outcome with their selected demographic variables.

Methodology: A Non experimental descriptive study design was adopted for the study. The population of the study was patients with lower respiratory tract disorders. 80 samples were selected by Simple Random sampling technique. Respiratory outcome of the patients with lower respiratory tract disorders was assessed using Respiratory Rate, Oxygen Saturation, Borg's Dyspnea Score and Peak Expiratory Flow Rate.

Results: The assessment of respiratory outcome of patients with Lower Respiratory Tract Disorders using various clinical parameters based on the pre-defined Criteria reveals that Out of 80 subjects, 16(20%) had Positive Outcome and 64(80%) had negative outcome. There is Significant Association between the Respiratory Outcome and the Age at P-Value of 0.0178 and Chi Square Value of 4.116. There is also Association between the Respiratory Outcome and the duration of respiratory illness at P-Value of 0.019 and Chi Square Value of 0.372.

Conclusion: The study finding concludes that the assessment of the respiratory outcome is very important in caring patients with lower respiratory tract disorders which helps in identifying the prognosis of the disease condition.

Keywords: Assessment, respiratory outcome, lower respiratory tract disorders

Introduction

Breathing is one of the most universal and habitual practices that humans do. Most of the time, we don't even think about it. Our lungs allow us to breathe in air and provide much-needed oxygen to the rest of the body. This is an amazing process that keeps us going every day!^[2].

Chronic respiratory diseases (CRDs) are diseases of the airways and other structures of the lung and the entire respiratory tract. Some of the most common are chronic obstructive pulmonary disease (COPD), bronchial asthma, occupational lung diseases and pulmonary hypertension. In addition to tobacco smoke, other risk factors like air pollution, occupational chemicals and specks of dust, and frequent lower respiratory infections during childhood also causes respiratory disorders. Chronic respiratory diseases are not curable, however, various forms of treatment that help dilate major air passages and improve shortness of breath can help reduce symptoms and increase the quality of life for people with the disease. The World Health Organization Global Alliance against Respiratory Diseases (GARD) has a vision of a world in which all people breathe freely and focuses in particular on the needs of people with CRDs in low-income and middle-income countries^[1].

Need for the study

Lower Respiratory Tract Disorders are a persistent and a pervasive health problem which imposes an enormous burden on the society^[7].

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Lower respiratory tract infections (LRTIs) cover a broad spectrum of pathological processes and aetiologies, including acute and chronic bronchitis, bronchiolitis and acute and chronic pneumonia, as well as pleural effusion, empyema, and lung abscess [2].

The American Lung Association in 2011 reported regarding bronchitis that more than 10 million Americans had chronic bronchitis in 2011. Seventy percent of those cases involved people over age 45 [3]. Office of Disease Prevention and Health Promotion in 2016 points out that more than 25 million people in the United States have asthma. Approximately 14.8 million adults have been diagnosed with Chronic Obstructive Pulmonary Disease, and around 12 million people have not yet been diagnosed with [4]. World Health Organization’s latest report published in 2017 shows that Lung Disease Deaths in India reached 896,779 or 10.19% of total deaths. The age adjusted Death Rate is 96.92 per 100,000 of population ranks India #4 in the world [5].

Hence, this study was proposed to assess the respiratory outcome using various clinical parameters and to correlate with the selected demographic variables and specific diseases of Lower Respiratory Tract.

Problem statement

A Descriptive Study to assess the respiratory outcome of patients with lower respiratory tract disorders admitted in Mahatma Gandhi Medical College & Research Institute, Puducherry.

Objectives

- To assess the respiratory outcome of patients with lower respiratory tract disorders.
- To associate the Respiratory Outcome of the patients with their selected demographic variables

Hypotheses

H₁ – Association exists between the respiratory outcome of patients with lower respiratory tract disorders and their selected demographic variables.

Methodology

A Non experimental descriptive study design was adopted for the study. The population of the study was patients with lower respiratory tract disorders. 80 samples were selected by Simple Random sampling technique. The Study Setting was Medical Wards of Mahatma Gandhi Medical College & Research Institute, Puducherry. Demographic Variables

were collected using interview schedule. Respiratory outcome of the patients with lower respiratory tract disorders was assessed using Respiratory Rate, Oxygen Saturation using Pulse Oximeter, Borg’s Dyspnea Score using Modified Borg’s Dyspnea Scale and Peak Expiratory Flow Rate using Peak Expiratory Flow Rate.

Criteria for Sample Selection

Inclusion Criteria

- Patients diagnosed with lower respiratory tract infections (COPD, bronchitis, bronchial asthma, bronchiolitis, and pulmonary tuberculosis).
- Both male and female patients.
- Patients with age more than 18 years.
- Patient who is conscious.

Exclusion Criteria

- Patient who is restless.
- Unresponsive patients.
- Patients on BIPAP ventilation.
- Patients who are critically ill, having decreased sensory perception.

Development of the instrument

The tool was developed based on literature review and opinion from experts in the field of Pulmonary Medicine and Medical Surgical Nursing. The tool consists of 2 parts.

Part – 1: Demographic Variables

It consists of interview schedule to assess the demographic data such as Age, Gender, Educational Status, Occupation, Monthly Income, Religion, Marital Status, Personal Habits, Duration of Illness and Family History of Respiratory Illness.

Part – 2: It includes assessment of the Respiratory Outcome using

- Respiratory Rate
- Oxygen Saturation
- Peak Expiratory Flow Rate
- Borg’s Dyspnea Scale

Modified Borg Dyspnea Scale

It is the scale used to rate the dyspnea. It starts at number 0 where no breathing difficulty at all and progresses through to number 10 breathing difficulty is maximal.

Rating	Description
0	Nothing at all
1	Just Noticeable
2	Very Slight
3	Slight
4	Slightly-Moderate
5	Moderate
6	Some Difficulty
7	Moderately Severe
8	Severe
9	Very Severe
10	Panic Level, Maximal Shortness of Breath

Interpretation

- 0 – Nothing at all
- 1–3 – Slight Breathlessness

- 4–6 – Moderate Breathlessness
- 7–10 – Severe Breathlessness

Representation of criteria of Respiratory Outcome from Respiratory Rate, Oxygen Saturation, Peak Expiratory Flow Rate and Modified Borg Dyspnea Scale Score.

Parameter		Criteria
I	Respiratory Rate	
	b)	12 — 20 Breaths/Minute — Normal
II	Oxygen Saturation	
	a)	95% - 100% - Normal
	b)	90% - 94% - Mild Hypoxemia
III	Peak Expiratory Flow Rate	
	a)	80% - 100% - Good Control
IV	Modified Borg Dyspnea Scale	
		0 - Nothing at all
I	Respiratory Rate	
	a)	< 12 Breaths/Minute — Bradypnea
	c)	> 20 Breaths/Minute — Tachypnea
	Oxygen Saturation	
II	c)	75% - 89% - Moderate Hypoxemia
	d)	<75% - Severe Hypoxemia
III	Peak Expiratory Flow Rate	
	b)	50% - 79% - Caution
	c)	<50% - Emergency
IV	Modified Borg Dyspnea Scale	
		1-3 – Slight Breathlessness
		4-6 – Moderate Breathlessness
		7-10 – Severe Breathlessness

Validity and reliability

The content validity of the instrument obtained from experts in the field of Pulmonary Medicine and Nursing. The experts were requested to give their opinion regarding relevance, accuracy and appropriateness of the items for further modification. As per the suggestions the necessary changes were incorporated in the tool.

The test-retest method (Karl Pearson Reliability Formula) to assess the reliability of the tool. The tool was reliable and feasible. The obtained reliability score was $r = 0.815$. No further changes were made in the tool after pilot study. The investigator proceeded for the main study.

Ethical Consideration

The proposed study was conducted after approval of Institutional Ethical Committee. Informed consent was obtained from the patient. Subjects were given the rights to withdraw from the study at any time.

Plan for data analysis

The Researcher used Descriptive statistics which include frequency, percentage and mean, median and standard deviation to assess the demographic variables of Patients with Lower Respiratory Tract Disorders. Chi-square test was used to find out the association between the respiratory outcome of patients with lower respiratory tract disorders and demographic variables.

Results and Discussion

Table 1: Distribution of Demographic Variables of Patients with Lower Respiratory Tract Disorders

S. No	Demographic Variables	N=80	%
1.	Age in Years		
	< 20	8	10
	20 – 40	27	33.75
	41 – 60	29	36.25
	> 60	16	20
2.	Gender		
	Male	48	60
	Female	32	40
3.	Residential Area		
	Rural	57	71.25
	Semi-Urban	18	22.5
	Urban	5	6.25
4.	Area of Work		
	Industry	12	15
	Farm	57	71.25
	Road/Construction Area	11	13.75
5.	Personal Habits		
	Smoking	25	31.25
	Tobacco Chewing	14	17.5
	Alcoholism	1	1.25
	Drug Abuse	3	3.75
	None	32	40
6.	Duration of Respiratory Illness		
	< 6 Months	12	15
	6 – 12 Months	33	41.25
	13 – 24 Months	20	25
	> 24 Months	15	18.75
7.	Family History of Respiratory Illness		
	Yes	72	90
	No	8	10
8.	Diagnosis		
	COPD	31	38.75
	Bronchial Asthma	25	31.25
	Bronchitis	6	7.5
	Pulmonary Tuberculosis	14	17.5
	Bronchiectasis	4	5

The Frequency and Percentage Distribution of Demographic Variables of patients with Lower Respiratory Tract Disorders is represented in following table

Majority of the Participants were aged between 41 – 60 Years (36.25%), Majority of the Patients were Female (60%), 71.25% of participants were residing in rural area, 71.25% were working in Farm, 31.25% of Participants were having Smoking Habits, Majority of Participants, 90% had family history of Respiratory Illness and 38.75% of Participants were diagnosed with Chronic Obstructive Pulmonary Disease.

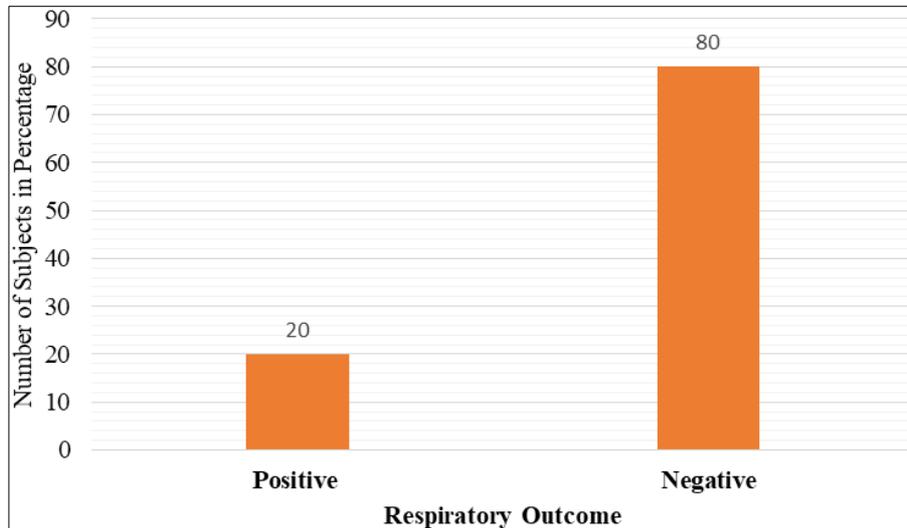


Fig 1: Assessment of Respiratory Outcome among Patients with Lower Respiratory Tract Disorders

Figure 1 represents the assessment of respiratory outcome of patients with Lower Respiratory Tract Disorders using various clinical parameters based on the pre-defined Criteria. Out of 80 subjects, 16(20%) had Positive Outcome and 64(80%) had negative outcome.

Association of the respiratory outcome of patients with lower respiratory tract disorders with their selected demographic variables

There is Significant Association between the Respiratory Outcome and the Age at P-Value of 0.0178 and Chi Square Value of 4.116. The study result reveals that as the age increases, the respiratory outcome decreases and the patients above the age group of 50 years show increased risk of decreased oxygen demand range among patients with respiratory disorders. This may due to degenerative process of lung alveolar cells and poor tidal capacity due to improper diaphragm expansion which will leads to poor oxygen consumption.

There is also Association between the Respiratory Outcome and the duration of respiratory illness at P-Value of 0.019 and Chi Square Value of 0.372. It reveals that as the duration of respiratory illness increases, the respiratory outcome becomes inefficient and decreases.

There is no Significant Association between the respiratory outcome and the other demographic variables like gender, residential area, area of work and family history of respiratory illness.

Implications

The researcher has derived the following implications from the study which are of primary concern in the field of nursing practice, nursing education, nursing administration and nursing research.

Nursing Practice

The nurse working in clinical setting should have the skill to assess the respiratory outcome of patients using various clinical parameters. The Nurse should have ability to operate various equipments like Pulse Oximeter and Peak Expiratory Flow Meter.

Nursing Education

Evidence-based practice is essential in promoting quality care. The nurses must know the importance of assessing the

respiratory outcome among patients with lower respiratory tract disorders. So the nurse educator should motivate the students to learn methods to assess the respiratory outcome.

Nurse Administration

Collaborate with hospital authorities in formulating policies to employ specially-qualified nurses Pulmonary Medicine units to assess the respiratory outcome. Conduct an in-service education program on importance of assessing respiratory outcome and the role of steam inhalation and other non-pharmacologic measures in promoting respiratory outcome.

Nursing Research

Encourage further research studies on the ways to promote good respiratory outcome. On the evidence of the review, more research needs to be conducted and disseminate the findings through conferences, seminars, publications in professional, national and international journals.

Recommendations

- The study can be replicated with a large sample for better generalization.
- More studies can be conducted on measures to improve respiratory outcome.
- Studies can be done to assess the knowledge, attitude and practice of nurse on assessment of respiratory outcome.

Conclusion

The study finding concludes that the assessment of the respiratory outcome is very important in caring patients with lower respiratory tract disorders which helps in identifying the prognosis of the disease condition. It also helps in evaluating the effectiveness of steam inhalation and other non-pharmacologic measures which helps in promoting the respiratory outcome.

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