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A QUASI EXPERIMENTAL STUDY TO EVALUATE THE EFFECTIVENESS OF RESPIRATORY CARE BUNDLE AMONG INPATIENTS WITH RESPIRATORY CONDITION AT AVMC & H, PUDUCHERRY

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Abstract: *A Quasi experimental study to evaluate the effectiveness of respiratory care bundle among inpatients with respiratory condition at AVMC & H, Puducherry. The study objectives were to assess the pretest and posttest level of respiratory problems among inpatients with respiratory condition in control group and experimental group, to evaluate the effectiveness of respiratory care bundle among inpatients with respiratory condition in the experimental group and control group. To find out to association between the post intervention of respiratory problems among in patients with respiratory condition with selected demographic variables the population of the study was patients selected at AVMC & H, Puducherry. 50 samples selected by using simple random sampling techniques ST George's respiratory questionnaire was used to assess the level of respiratory problems. It is 14 items. Data were analyzed by using descriptive and inferential statistics. The results show that majority of the inpatients with respiratory conditions in the pre intervention of experimental group 17 (68%) had severe respiratory problem. It shows that majority of the inpatients with respiratory condition in the pre intervention of control group 18 (72%) had severe respiratory condition. The calculated student independent 't' test value t = 0.144 in the pre intervention comparison between the groups was not found to be statistically significant. The calculated student independent 't' test value t = 12.263 in the post intervention comparison between the groups was found to be statistically significant at p<0.001 level.*

Key Words: *Respiratory Care Bundle, Inpatients, Respiratory Conditions.*

"Without food, 2 to 3 weeks, 2 to 3 days without water, only 3 to 5 minutes without breathing."
- Anonymous

1. INTRODUCTION:

Nursing is an art and science that requires respect for each client's dignity and artistic care delivery. It is founded on a body of knowledge that is always evolving as a result of new discoveries and innovations. We should be aware, behave consistently, routinely, and put the fundamentals of good nursing into practice when providing nursing care.

The process of breathing involves the exchange of gases between the blood and atmospheric air, followed by the blood and bodily cells. The air that is breathed in is warmed or cooled to body temperature as it travels through the airways to reach the lungs. It is also moistened as it becomes saturated with vapor and is cleaned as dust particles stick to the mucus that coats the lining membrane. (1)

Asthma, chronic obstructive pulmonary disease (COPD), interstitial lung disease (ILD), pneumonia, and tuberculosis (TB) are among the respiratory illnesses that are now recognized as important global health issues. Because they are the product of gene-environment interactions, respiratory illnesses are polygenic. As with many chronic diseases, COPD and asthma have both changeable and immutable risk factors that can be avoided. This shows that other factors, such as exposure to environmental tobacco smoke, workplace dust exposure, indoor and outdoor air pollution,

and exposure to biomass smoke produced during the heating and cooking of biomass in poorly ventilated homes, have emerged as significant risk factors among women, particularly in developing nations. Numerous epidemiological studies have identified low socioeconomic status to be a significant risk factor. If the risk factors are managed, these diseases are largely avoidable. (2)

Asthma is often under-diagnosed and under-treated, particularly in low- and middle-income countries. People with under-treated asthma can suffer sleep disturbance, tiredness during the day, and poor concentration. Asthma sufferers and their families may miss school and work, with financial impact on the family and wider community. If symptoms are severe, people with asthma may need to receive emergency health care and they may be admitted to hospital for treatment and monitoring. In the most severe cases, asthma can lead to death. (3)

An estimated 65 million people have moderate to severe chronic obstructive pulmonary disease. The most important step in treating COPD is to stop smoking. Exercise and medications can also help the most commonly used medications are called bronchodilators, which help to open up the airways and allow more air into the lungs. Chronic obstructive pulmonary disease is the third leading cause of death worldwide, causing 3.23 million deaths in each year. There are 235 million peoples currently suffering from asthma. Most asthma - related deaths occur in low- and lower - middle income countries. (4)

Respiratory tract infection caused by influenza kill between 2,50,000 and 5,00,000 people and cost between US $ 71 and 167 billion annually. In 2015, 10.4 million people developed in tuberculosis (TB) and 1.4 million people died from it. T Chintamani (2015) stated that asthma affects an estimated 25,000,000 Indians every year and this number is likely to increase by 50 % by the year of 2020. (5)

A total of 1.5 million people died from TB in 2020 (including 214 000 people with HIV). Worldwide, TB is the 13th leading cause of death and the second leading infectious killer after COVID-19 (above HIV/AIDS). (6)

2. NEED FOR THE STUDY :

Since 1963, the World Health Organization has been concerned with the difficult problem of estimating the actual importance of ARI within the general evolution of communicable diseases. The analysis of information available relating to the changes that occurred between 1957/1958 and 1967/1968 in 32 countries at different stages of development. (7)

Tuberculosis remains a significant cause of both illness and death in developed countries especially among individuals with a suppressed immune system. People with HIV are particularly vulnerable to death due to tuberculosis. Tuberculosis accounted for 35% of global mortality in individuals with HIV/AIDS in 2015. (W.H.O, 2017). Children are also vulnerable, and tuberculosis was responsible for one million illnesses in children in 2015 according to the WHO. (8)

The Global Burden of Disease Study (2016) reports a prevalence of 251 million cases of respiratory diseases globally in 2016. Globally, it is estimated that 3.17 million deaths were caused by the disease in 2015 (that is, 5 % of all deaths globally in that year). More than 90 % of deaths occur due to respiratory diseases are in low- and middle-income countries. (9)

There is a plethora of evidence to suggest that the care we give those with respiratory disease fluctuates. Variation like this can cause mistakes, injury, and worse outcomes for our patients. By providing the framework for the delivery of care, respiratory care bundles (RCBs) aim to lessen this variation. (10)

According to the National Centre for Complementary and Integrative Health, deep breathing entails taking slow, deep breaths through the nose for a count of 10, followed by slow, complete exhalations for the same number of counts. Five to ten times, several times a day, the procedure may be repeated. (11)

The air that frequently becomes trapped in the lungs of patients with pulmonary disease pushes down on the diaphragm. The work of breathing must thus be shifted to the neck and chest muscles to a greater extent. The diaphragm may become flattened and weaker as a result, making it less effective. With the aid of diaphragmatic breathing, patients can strengthen their diaphragm, reduce work-related breathing by lowering their breathing rate, reduce oxygen demand, and breathe with less effort and energy. (12)

Suzane C Smeltzer (2008) stated that, A medical tool called an Incentive Spirometer is used to assist patients in bettering the efficiency of their lungs. It is given to patients recovering from cardiac surgery or other procedures that need lengthy in-bed recovery and prolonged time under anaesthesia. It is also given to individuals who have had any operation that could endanger respiratory function, particularly surgery to the lungs themselves. Patients recovering from pneumonia or rib injuries are also given an incentive spirometer to assist reduce the possibility of fluid accumulation in the lungs. Wind instrument players who seek to improve their air flow can also utilize it. (13)

Hence the researcher felt the need of evaluating the effectiveness of respiratory care bundle among inpatients with respiratory conditions

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3. Statement of the problem:

A Quasi experimental study to evaluate the effectiveness of respiratory care bundle among inpatients with respiratory conditions at AVMC & H, Puducherry.

4. Objectives:

- To access the pre test and post level of respiratory problems among inpatients with respiratory condition in control and experimental group.
- To evaluate the effectiveness of respiratory care bundle among inpatients with respiratory condition in the experimental group and control group.
- To find out the association between the post intervention of respiratory problems among inpatients with respiratory condition with selected demographic variables in experimental group.

4.1 Hypotheses:

H1 - The mean post test level of respiratory condition will be significantly lower than the pre test level of respiratory condition in the experimental group.

H2 - The mean post test level of respiratory condition in experimental group will be significantly lower than the post test level of respiratory condition in control group.

H3 -There will be a significant effectiveness of respiratory care bundle among inpatients with respiratory condition in experimental group.

H4- There will be a significant association between level of respiratory problems with the selected demographic variables among inpatients with respiratory condition.

5. REVIEW OF LITERATURE :

Izadi - avanji FS, et al (2020) A true experimental study was conducted on deep breathing exercise on dyspnea in moderate COPD patients. The subjects of the study were 240. Out of which 120 subjects were manipulated and the rest were getting no intervention. According to the study, it revealed that there were considerably more effective to the subject given exercise rather than those without intervention. Thus, it proved that deep breathing exercise was better than compared to another group. (14)

Das S, Mukherjee S, et al (2019) A pre- experimental study was conducted on breathlessness in patients with COPD. The twenty-two patients with mild to severe COPD were studied. Dyspnea was assessed by a Modified Borg Scale. The patients with deep breathing exercises exhibited a significant reduction in end expiratory volume of the chest wall. Deep breathing exercises decreases end expiratory volume of chest wall and reduce breathlessness. The study showed that deep breathing exercises are more effective in reducing dyspnea in COPD patients. Dyspnea at rest and during exercise in COPD. The eight COPD patients (6male and 2 female) with a mean age of 11 years. Deep breathing exercises promoted a slower and deeper breathing pattern both at rest and during exercise. Deep breathing has a variable effect on dyspnea when performed during exercise by patient with COPD. The study showed effectiveness of deep breathing exercises in patient at rest. (15)

6. MATERIALS AND METHODS:

The research approach and design selected for this study was quantitative approach and Quasi - experimental, pre test, post test control group design respectively. The study setting was Aarupadai veedu medical college and hospital, Pondicherry. The sample size was 50 (25 samples in Experimental group and 25 samples in Control group), simple random sampling Technique was used for sample selection. The period of data collection was about 1 week. You have been selected to participate in this study. So, you will be asked a few questions non demographical data to assess the knowledge and information were collected. Data were complete, analyzed and intervention will be made based on research study. During the data collection procedure, the subject was asked to sit in there laxed manner. In pre intervention, the level of respiratory condition was assessed with ST George's respiratory questionnaire. Before doing deep breathing exercises and incentive spirometry up to 3times per day, Morning, Afternoon, Evening for 3 consecutive days. Deep breathing exercises followed by Incentive spirometry were given for 10minutes each. The post intervention was conducted on the third day with the ST George's respiratory questionnaire. The control group received the routine medical and nursing care. The participants of the control group were informed that the respiratory status would be assessed to determine this verity of illness.

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7. DATA ANALYSIS:

Both descriptive and inferential statistical methods was used for analyzing the data, planned to describe the data as percentage, mean and standard deviation and those were used to analyze the demographic variables. For the distribution of demographic data, simple percentage was used. Unpaired t" test was used to compare the effectiveness of the interventions among experimental and control group. Chi-Square test was used to find out the association between demographic variables and level of dyspnea and after the administration of Respiratory care bundle.

8. RESULT:

Table 1: Frequency and percentage distribution of demographic variables of inpatients with respiratory conditions in the experimental and control group.

N = 50(25+25)

Demographic Variables	Experimental Group		Control Group	
	F	%	F	%
Age in years				
21 – 30	-	-	-	-
31 – 40	5	20.0	10	40.0
41 – 50	12	48.0	10	40.0
51 – 60	8	32.0	5	20.0
Gender				
Male	10	40.0	11	44.0
Female	15	60.0	14	56.0
Marital status				
Married	12	48.0	13	52.0
Unmarried	3	12.0	0	0
Separate	8	32.0	11	44.0
Widow	2	8.0	1	4.0
Religion				
Hindu	17	68.0	8	32.0
Christian	5	20.0	12	48.0
Muslim	3	12.0	5	20.0
Others	-	-	-	-
Educational status				
No formal education	6	24.0	5	20.0
Primary education	7	28.0	10	40.0
High school and higher secondary	4	16.0	4	16.0
Graduate	8	32.0	6	24.0
Occupation				
Unemployed	6	24.0	5	20.0
Self-employed	9	36.0	10	40.0
Private employee	4	16.0	4	16.0
Government employee	6	24.0	6	24.0

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Demographic Variables	Experimental Group		Control Group	
	F	%	F	%
Family income per month				
Less than Rs.5000	6	24.0	1	4.0
Rs.5001 – Rs.10000	3	12.0	3	12.0
Rs.10001 – Rs.15000	9	36.0	21	84.0
More than Rs.15001	7	28.0	0	0
Place of residence				
Rural	13	52.0	13	52.0
Urban	12	48.0	12	48.0
Duration of illness				
Less than 6 months	4	16.0	0	0
6 months – 1 year	17	68.0	15	60.0
More than 1 year	4	16.0	10	40.0
Family history of respiratory diseases				
Yes	15	60.0	12	48.0
No	10	40.0	13	52.0
Are you taking treatment for respiratory diseases?				
Yes	15	60.0	25	100.0
No	10	40.0	0	0

The table 1 shows that, most of the inpatients with respiratory conditions in the experimental group, 12(48%) were in the age group of 41 – 50 years, 15(60%) were female, 12(48%) were married, 17(68%) were Hindus, 8(32%) were graduates, 9(36%) were self-employed, 9(36%) had family income of Rs.10001 – Rs.15000, 13(52%) were residing in rural area, 17(68%) had the illness for 6 months – 1 year, 15(60%) had no family history of respiratory diseases and 15(60%) were taking treatment for respiratory diseases.

The table 1 further shows that, most of the inpatients with respiratory conditions in the control group, 10(40%) were in the age group of 31 – 40 and 41 – 50 years respectively, 14(56%) were female, 13(52%) were married, 12(48%) were Hindus, 10(40%) had primary education and were self-employed, 21(84%) had family income of Rs.10001 – Rs.15000, 13(52%) were residing in rural area, 15(60%) had the illness for 6 months – 1 year, 13(52%) had no family history of respiratory diseases and 25(100%) were taking treatment for respiratory diseases.

Table 2: Frequency and percentage distribution of pre and post intervention level of respiratory problems among inpatients with respiratory conditions in the experimental group.

n = 25

Level of Respiratory Problems	Preintervention		Post Intervention	
	F	%	F	%
Mild (≤22)	0	0	11	44.0
Moderate (23 – 44)	8	32.0	14	56.0
Severe (≥45)	17	68.0	0	0

The above table 2 shows that in the preintervention of experimental group 17(68%) had severe respiratory problems and 8(32%) had moderate level of respiratory problem whereas in the post intervention, 14(56%) had moderate level of respiratory problem and 11(44%) had mild level of respiratory problem.

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Table 3: Frequency and percentage distribution of pre and post intervention level of respiratory problems among inpatients with respiratory conditions in the control group.

n = 25

Level of Respiratory Problems	Preintervention		Post Intervention	
	F	%	F	%
Mild (≤22)	0	0	0	0
Moderate (23 – 44)	7	28.0	8	32.0
Severe (≥45)	18	72.0	17	68.0

The above table 3 shows that in the preintervention of control group 18(72%) had severe respiratory problems and 7(28%) had moderate level of respiratory problem whereas in the post intervention, 17(68%) had severe level of respiratory problem and 8(32%) had moderate level of respiratory problem.

Table 4: Comparison of preintervention and post intervention level of respiratory problems among inpatients with respiratory conditions within and between the experimental and control group.

N = 50(25+25)

Respiratory Problems	Preintervention		Post Intervention		Mean Difference	Student Independent 't' test
	Mean	S.D	Mean	S.D		
Experimental	50.28	7.93	25.68	5.99	24.60	**t=19.408 p=0.0001 S*****
Control	49.96	7.81	49.84	7.82	0.12	t=1.809 p=0.083 N.S
Mean Difference	0.32		24.16		***p<0.001 S – Significant N.S – Not Significant	
Student Independent 't' test & p-value	t=0.144 p=0.886 N.S		**t=12.263 p=0.0001 S*****			

***p<0.001, S – Significant

The table 3 depicts that the calculated preintervention mean score of respiratory problems in the experimental group was 50.28±7.93 and the post intervention mean score was 25.68±5.99. The mean difference score was 24.60. The calculated paired 't' test value of t = 19.408 was found to be statistically significant at p<0.001 level. This clearly infers that respiratory care bundle administered to the inpatients with respiratory conditions in the experimental group was found to be effective in reducing the level of respiratory conditions in the post test.

The table 3 depicts that the calculated preintervention mean score of respiratory problems in the control group was 49.96±7.81 and the post intervention mean score was 49.84±7.82. The mean difference score was 0.12. The calculated paired 't' test value of t = 1.809 was not found to be statistically significant.

The calculated student independent 't' test value t = 0.144 in the pre intervention comparison between the groups was not found to be statistically significant.

The calculated student independent 't' test value t = 12.263 in the post intervention comparison between the groups was found to be statistically significant at p<0.001 level.

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Table 5: Association of post intervention level of respiratory problems among inpatients with respiratory conditions with their selected demographic variables in the experimental group.

n = 25

Demographic Variables	Mild		Moderate	Severe			Chi-Square Value
	No.	%	No.	%	No.	%	
Age in years							χ^2=1.698 d.f=2 p = 0.428 N.S
21 – 30	-	-	-	-	-	-	
31 – 40	2	8.0	3	12.0	-	-	
41 – 50	4	16.0	8	32.0	-	-	
51 – 60	5	20.0	3	12.0	-	-	
Gender							χ^2=0.108 d.f=1 p = 0.742 N.S
Male	4	16.0	6	24.0	-	-	
Female	7	28.0	8	32.0	-	-	
Marital status							χ^2=0.480 d.f=3 p = 0.923 N.S
Married	6	24.0	6	24.0	-	-	
Unmarried	1	4.0	2	8.0	-	-	
Separate	3	12.0	5	20.0	-	-	
Widow	1	4.0	1	4.0	-	-	
Religion							**χ^2=9.244 d.f=2 p = 0.010 S****
Hindu	6	24.0	11	44.0	-	-	
Christian	5	20.0	0	0	-	-	
Muslim	0	0	3	12.0	-	-	
Others	-	-	-	-	-	-	
Educational status							χ^2=4.345 d.f=3 p = 0.226 N.S
No formal education	3	12.0	3	12.0	-	-	
Primary education	3	12.0	4	16.0	-	-	
High school and higher secondary	0	0	4	16.0	-	-	
Graduate	5	20.0	3	12.0	-	-	
Occupation							χ^2=0.649 d.f=3 p = 0.885 N.S
Unemployed	3	12.0	3	12.0	-	-	
Self-employed	3	12.0	6	24.0	-	-	
Private employee	2	8.0	2	8.0	-	-	

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Demographic Variables	Mild		Moderate	Severe			Chi-Square Value
	No.	%	No.	%	No.	%	
Government employee	3	12.0	3	12.0	-	-	
Family income per month							
Less than Rs.5000	3	12.0	3	12.0	-	-	χ^2=1.132 d.f=3 p = 0.769 N.S
Rs.5001 – Rs.10000	2	8.0	1	4.0	-	-	
Rs.10001 – Rs.15000	3	12.0	6	24.0	-	-	
More than Rs.15001	3	12.0	4	16.0	-	-	
Place of residence							**χ^2=6.997 d.f=1 p = 0.008 S****
Rural	9	26.0	4	16.0	-	-	
Urban	2	8.0	10	40.0	-	-	
Duration of illness							χ^2=0.172 d.f=2 p = 0.918 N.S
Less than 6 months	2	8.0	2	8.0	-	-	
6 months – 1 year	7	28.0	10	40.0	-	-	
More than 1 year	2	8.0	2	8.0	-	-	
Family history of respiratory diseases							χ^2=1.732 d.f=1 p = 0.188 N.S
Yes	5	20.0	10	20.0	-	-	
No	6	24.0	4	16.0	-	-	
Are you taking treatment for respiratory diseases?							χ^2=0.108 d.f=1 p = 0.742 N.S
Yes	7	28.0	8	32.0	-	-	
No	4	16.0	6	24.0	-	-	

**p<0.01, S – Significant, N.S – Not Significant

The table 4 shows that the demographic variables religion **(χ^2=9.244, p=0.010)** and place of residence **(χ^2=6.997, p=0.008)** had shown statistically significant association with post intervention level of hemoglobin among inpatients with respiratory conditions at p<0.01 level respectively and the other demographic variables had not shown statistically significant association with post intervention level of hemoglobin among inpatients with respiratory conditions.

9. RECOMMENDATIONS:

- A simple study can be done on large sample.
- An experimental study can be conducted by pre and posttest.
- A comparative study can be done of deep breathing exercise in our future.
- A descriptive study can be conducted.

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10. CONCLUSION:

The main conclusion of this present study was the deep breathing exercise is effectively reducing the respiratory condition among inpatients. This study clearly stated that deep breathing exercise plays a vital role to reduce the respiratory problems patients who have on respiratory condition in patients.

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