

STUDY OF FACTORS OTHER THAN DISEASE SEVERITY WHICH INFLUENCE OUTCOMES OF OBSTRUCTIVE AIRWAY DISEASE PATIENTS IN THE RICU

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ABSTRACT

BACKGROUND – Obstructive Airway Diseases (OAD) include COPD, Bronchial Asthma, Bronchiectasis , Cystic Fibrosis and Bronchiolitis and are characterised by recurrent exacerbations and remissions of cough and breathlessness with diminished expiratory airflow, and Spirometrically characterised decreased FEV1 , FEV1/FVC ratio and FEF25-75 % . 3 to 20 % of the above patients have at least one hospitalisation in a year and around 12 % of these hospitalised patients require transfer to RICU for higher levels of care

AIM AND OBJECTIVE – To study factors other than disease severity which influence outcomes of Obstructive Airway Disease patients in the RICU and to document whether the patients and the attending RICU Nurses’ demographic characteristics have any role in deciding the final outcome.

METHODOLOGY – 30 Consecutive Obstructive Airway Disease patients (18 COPD, 7 Bronchiectasis, 5 Bronchial Asthma patients) admitted in the RICU at the Department of Respiratory Medicine, ACSR Government Medical College, Nellore, A.P, were taken up for the study between October 1st 2023 and December 1st 2023 for a period of 2 months. All of them were in Respiratory Failure (SpO₂– 40 to 75% in room air) and had SAPS II Score of 50 to 60 and were either on NRBM (Non Re-Breathing Mask) or NIV (Non Invasive Ventilation) or Mechanical Ventilator. The demographic data of patients and the attending RICU Nurses were collected.

RESULTS - Out of the 30 admitted patients- 18 (60%) were COPD patients, 7 (23%) Bronchiectasis, 5 (17%) were Bronchial asthma. Most patients 19 (63%) belonged to the 50 -70 years age group. There were 18 males (60%) and 12 females (40%) in the study. Most patients 60% (18 patients) belonged to the below poverty line group, though 63% (20 patients) had studied up to High School. All patients had the States' Health Insurance -AarogyaSree and good family and social support except 2, who were destitutes. 60% (18 patients) were addicted to Smoking, most of them had more than 20 pack years and 5 of these were addicted to both smoking and alcohol. Diabetes (5 patients), Hypertension (5 patients) and Cardiac disease (4 patients) were observed. Out of the 13 Nurses attending these patients in 3 shifts for the above 2 months, most belonged to the 30 - 40 year age group 10 (77%). There was only one male nurse, the rest of the 12 were females. 11 of the 13 nurses (84%) were well qualified BSc & MSc(Nursing) trained. About 5 nurses (40%) were contract nurses and others - regular. 11 out of the 13 nurses (85%) had more than 5 years experience of working in RICU and working with patients on NIV and Mechanical ventilator. Their knowledge of Hand Hygiene, patients' oral care and complications of NIV and Mechanical Ventilation was good. Of the 30 patients, outcome was 80% (24 patients) were Normoxemic at the time of discharge, 7% (2 patients) were discharged with home oxygen and 13% (4 patients) died during hospital stay. The average length of stay in RICU was 6 to 15 days (46%).

CONCLUSIONS – In our study, Age > 60 years, Male sex, and a diagnosis of COPD, longer duration of Smoking, alcoholism, history of previous hospitalisation and poor ventilation seem to have a deleterious influence on the outcomes of Obstructive Airway Disease patients in RICU. All 4 deaths occurred in patients with above factors. Earlier use of Domiciliary oxygen and type of cooking fuel seem to have no influence on the outcome.

KEYWORDS – Obstructive Airway Diseases, RICU, Outcomes, Factors.

INTRODUCTION - Obstructive Airway Diseases include COPD, Bronchial Asthma, Bronchiectasis , Cystic Fibrosis and Bronchiolitis and are characterised by recurrent exacerbations and remissions of cough and breathlessness with diminished expiratory airflow, and Spirometrically show FEV1 , FEV1/FVC ratio and FEF25-75 % below predicted values⁽¹⁾. A Respiratory Intensive Care Unit is a designated area, specifically designed for management of patients with acute respiratory conditions with an essential endeavour of meticulous cardiorespiratory monitoring and holistic management of acute respiratory conditions⁽²⁾.

Most patients with OAD, experience recurrent exacerbations; frequent exacerbations are associated with lower quality of life, and in COPD, a faster decline in lung function⁽³⁾. Most patients require repeated hospitalizations and mortality rates after admission are very high, upto 43% after 2 years⁽⁴⁾. These patients in the RICU are taken care of by Intensivists, Specialist doctors, RICU Nurses and paramedics; placed on oxygen / NIV/ MV based on oxygenation levels & SAPS Score. Nurses represent an appropriate resource to deliver care and support to Obstructive Airway Disease patients, throughout the course of the disease, particularly in relation to early discharge, hospital at home management and rehabilitation programmes⁽⁵⁾.

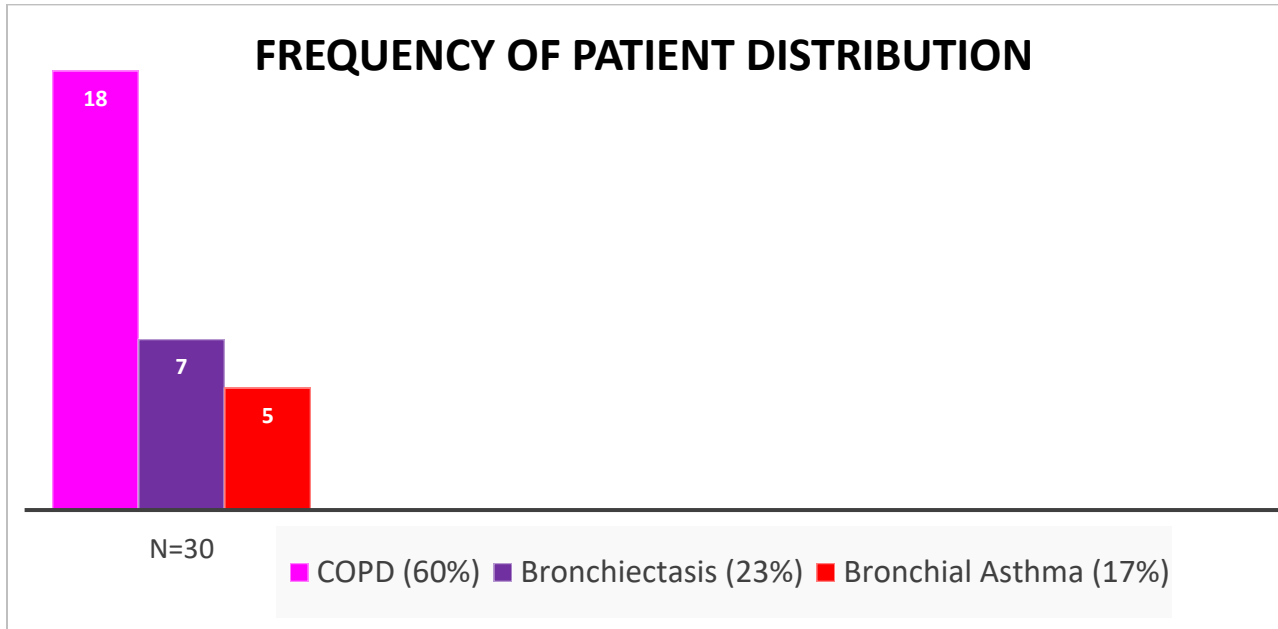
Besides the severity of the given disease and availability of good treating doctors and nursing care, several factors – age, gender, duration of illness, addictions, social support, exposure to allergens and pollutants, financial criteria and co morbidities seem to play an important role in the outcome of these OAD patients admitted to an RICU with an exacerbation. This study was embarked upon to study such demographic factors.

METHODOLOGY – Between October 1st 2023 and December 1st 2023, a two month period, 30 consecutive Obstructive Airway Disease patients (COPD, Bronchial Asthma and Bronchiectasis) admitted to the RICU, Department of Respiratory Medicine, ACSR Government Medical College, Nellore, AP were recruited for the study. All of them were in Respiratory failure, were either on NRBM (Non Re-Breathing

Mask) or NIV (Non Invasive Ventilation) or Mechanical Ventilator. Their average saturation in room air was 40 -75% and SAPS II Score was 50 -60 %. The demographic data of patients and attending RICU Nurses was collected.

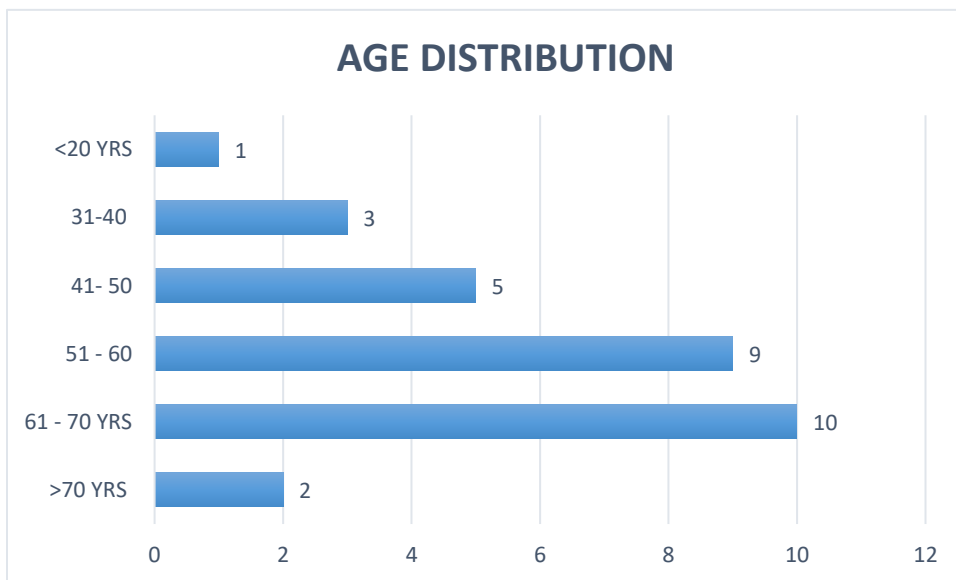
RESULTS –

1.PATIENT DISTRIBUTION: Out of the 30 admitted patients- 18 (60%) were COPD patients, 7 (23%) Bronchiectasis, 5 (17%) were Bronchial asthma



2. AGE DISTRIBUTION

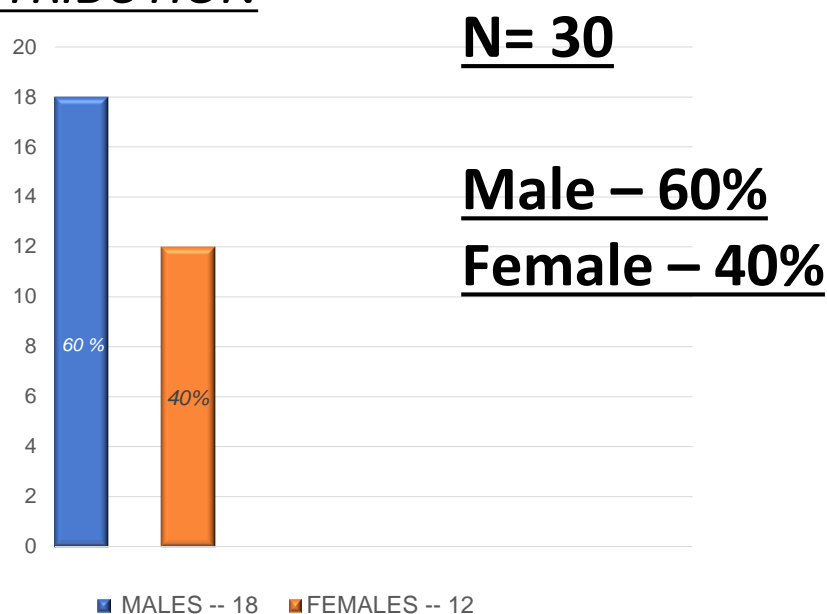
Most patients 19 (63%) belonged to the 50 -70 years age group,



AGE DISTRIBUTION	NO. OF PATIENTS (N=30)
>75 years	2
61 – 70 years	10
51 – 60 years	9
41 – 50 years	5
31 – 40 years	3
<20 years	1

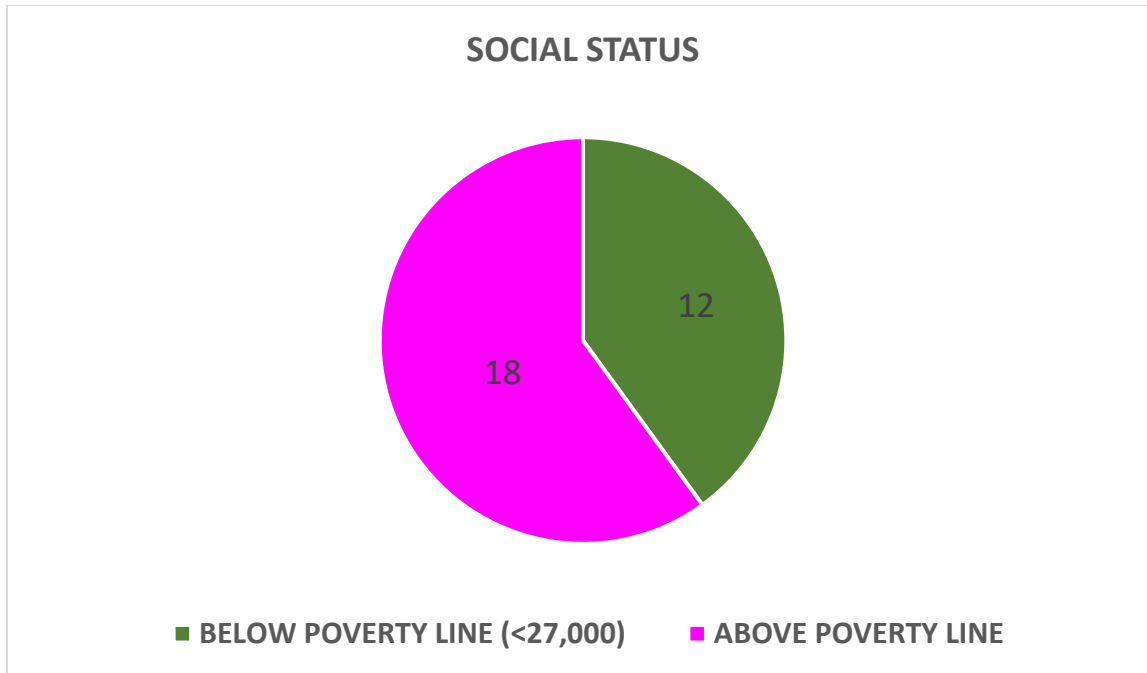
3.GENDER DISTRIBUTION – There were 18 males (60%) and 12 females (40%) in the study

GENDER DISTRIBUTION

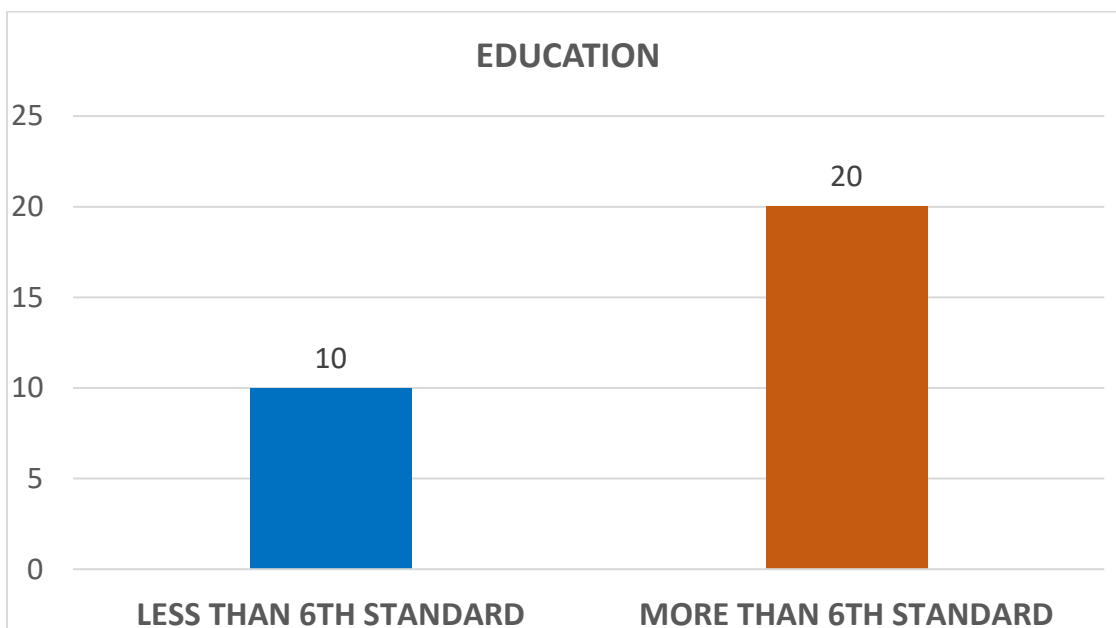


Our study results were in concurrence with the Italian SARA study (Salute Respiratoria nell Anziano) of 2012, which analysed the relationship between anthropometric variables and spirometric variables wherein age group of 65- 93 years was a risk factor for Obstructive Airway Disease even in Non-smokers

4. SOCIAL FACTORS- Most patients 60% (18 patients) belonged to the below poverty line group (annual income less than Rs.27,000)



though 63% (20 patients) had studied up to High School.



All patients had the States’ Health Insurance -AarogyaSree and good family and social support except 2, who were destitutes

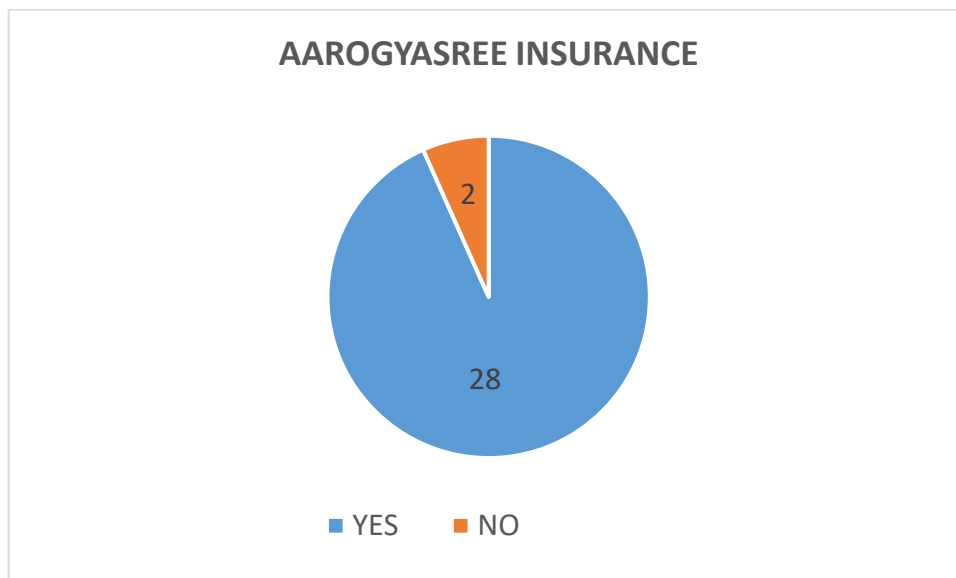


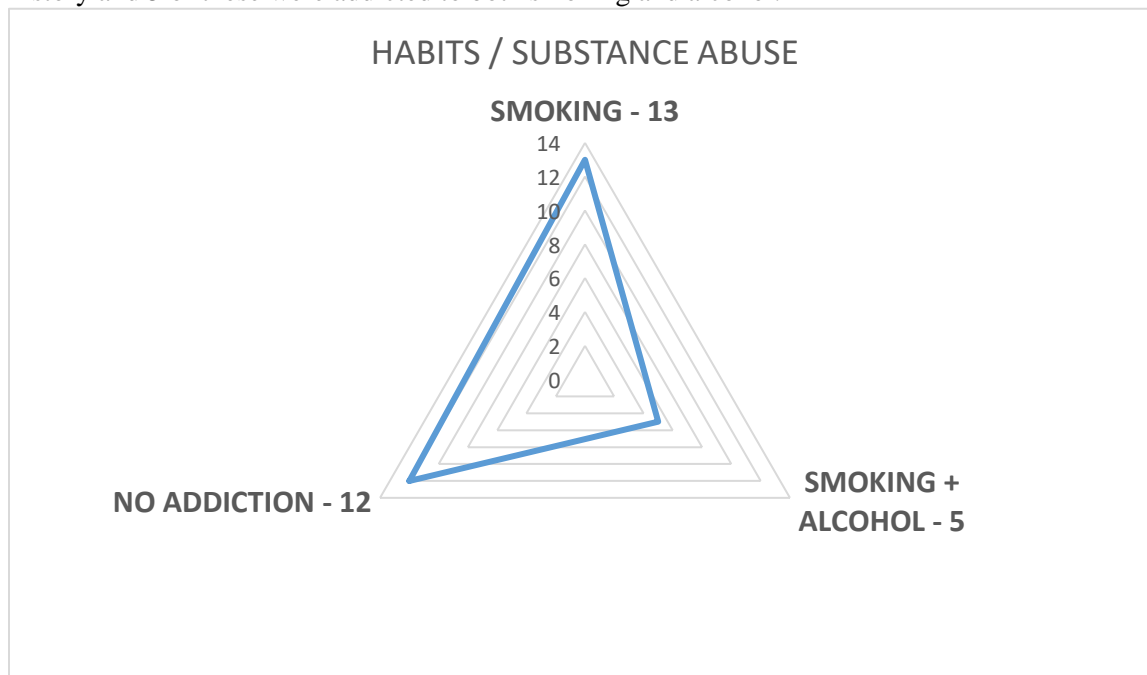
TABLE 1 : DEMOGRAPHIC CHARACTERS

S.no	Demographic Character	FREQUENCY	TOTAL	P value	Chi value
1	H/O CHILDHOOD RESPIRATORY DISEASES	YES	12	<0.0001 (Significant)	32.78
		NO	18		
2	SMOKING	YES	18	-	-
		NO	12		
3	DURATION OF SMOKING	0-5 YEARS	0	<0.001 (Significant)	32.78
		5-10 YEARS	2		
		10-15 YEARS	10		
		>15 YEARS	6		
4	ALCOHOL	YES	5	<0.0001 (Significant)	71.3
		NO	25		
5	H/O PREVIOUS HOSPITALIZATION	YES	24	<0.0001 (Significant)	71.3
		NO	6		
6	USAGE OF OXYGEN AT HOME	YES	2	0.11	2.55
		NO	28		
7	FAMILY HISTORY OF COPD	YES	6	-	-
		NO	24		
8	EDUCATION	ILLITERATE	10	-	-
		EDUCATED	20		

9	INCOME	BELOW POVERTY LINE	12	-	-
		ABOVE POVERTY LINE	18	-	-
10	OCCUPATION	SKILLED	12	-	-
		UNSKILLED	18		
11	LACK OF ACCESS TO HEALTH CARE	YES	2	0.0001 (Significant)	30.4
		NO	28		
12	COOKING FUEL	GAS	14	0.58	0.3
		WOOD	16		
13	TYPE OF HOUSING	PUCCA	16	-	-
		KUCCHA	14		
14	VENTILATION	GOOD	24	0.001 (Significant)	51
		POOR	4		
15	TYPE OF FAMILY	NUCLEAR	18	-	-
		JOINT	12		
16	PREVIOUS H/O COVID	YES	9	-	-
		NO	21		
17	DRUGS AFFECTING OUTCOMES	YES	0	-	-
		NO	30		

Lena Ly, Amy Pascoe et al in their 2023 study (article in the European Respiratory Review 2023 32: 230068)⁽⁶⁾ agreed that social determinants of health - income, education, occupation, social class had a significant impact on chronic lung disease like COPD and Interstitial Lung disease.

60% (18 patients) in our study were addicted to Smoking, most of them had more than 20 pack years history and 5 of these were addicted to both smoking and alcohol.



American lung association data of 2012 suggests 85 – 90% of COPD results from smoking either directly or second hand smoke. A 2016 study published in Medical News Today⁽⁷⁾ came to the conclusion that

Alcoholism also shows links with COPD and Obstructive airway disease through its negative effect on lungs’ immune response, inability to clear secretions during bouts of alcoholism and decrease in antioxidants.

TABLE 2: COMORBIDITIES, PREVALENCE, ASSOCIATION WITH OUTCOME.

S NO	COMORBIDITIES	PREVALENCE N	PERCENTAGE(%)	P value	Chi value
1	ALLERGIES	8	28	} <0.0001 (Significant)	114.93
2	ANEMIA	24	80		
3	CVS	4	13		
4	COGNITIVE IMPAIRMENT	3	10		
5	DEPRESSION	1	3		
6	DIABETES	5	16		
7	HYPERTENTION	6	17		
8	GERD	18	60		
9	AIDS	0	0		
10	LUNG CANCER	0	0		
11	OSTEOPOROSIS	0	0		
12	OBESITY	4	13		
13	SLEEP APNEA	0	0		

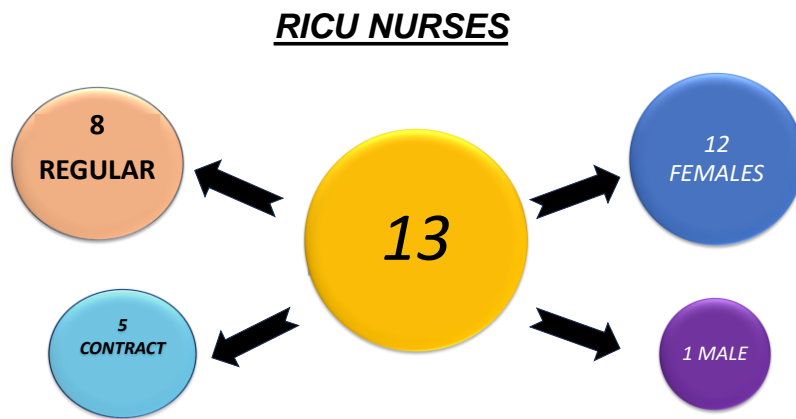
Diabetes (5 patients), Hypertension (5 patients) and Cardiac disease (4 patients) was observed. All co morbidities including Anaemia, Allergies, Depression, Osteoporosis showed statistically significant association.

5.RICU NURSES- DEMOGRAPHY - Out of the 13 Nurses attending these patients in 3 shifts for the above 2 months, most belonged to the 30 - 40 year age group 10 (77%),

AGE DISTRIBUTION	NUMBER
30 – 40 years	10
40 – 50 years	3

There was only one male nurse, the rest of the 12 were females. 11 of the 13 nurses (84%) were well qualified BSc & MSc(Nursing) trained.

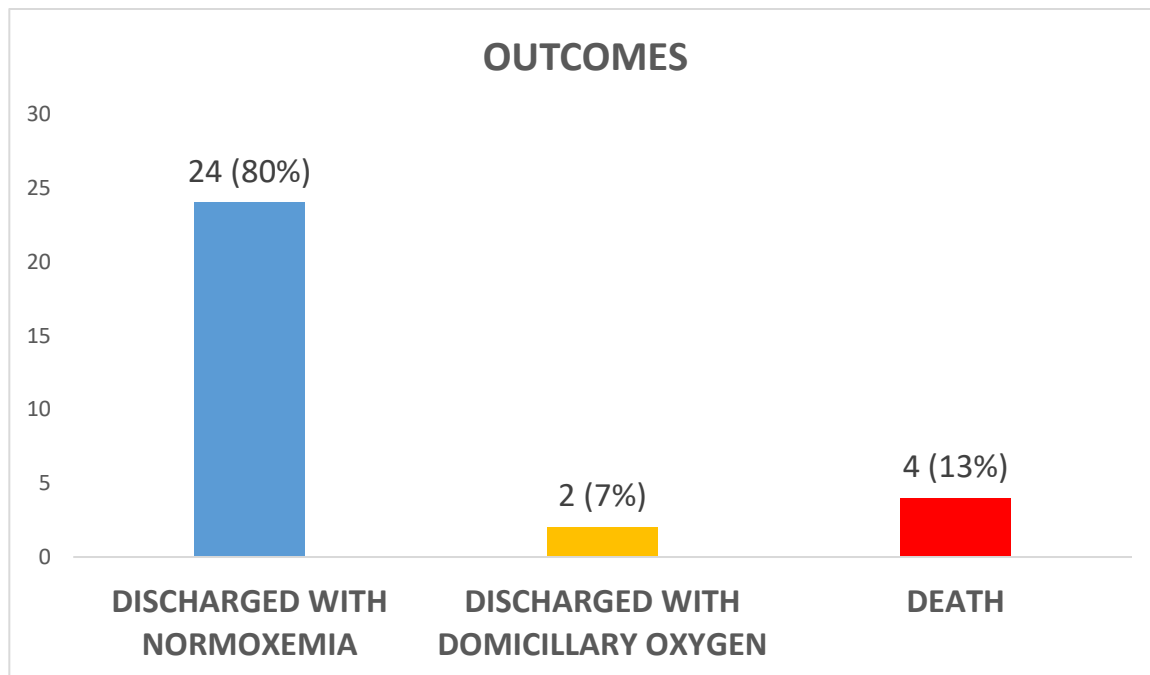
About 5 nurses (40%) were contract nurses and others regular.



11 out of the 13 nurses (85%) had more than 5 years experience of working in RICU and working with patients on NIV and Mechanical ventilator. Their knowledge of Hand Hygiene, patients’ oral care and complications of NIV and Mechanical Ventilation was good.

The PRISMA statement regarding Nurse led interventions in OAD patients published in the Journal of Environmental Public Health in August 2022 confirmed that, in patients with Obstructive airway disease especially COPD patients, improvements in physical status, quality of life, anxiety and reduction in hospital admission were observed with good nursing care.

6.OUTCOMES: Of the 30 patients, outcome was 80% (24 patients) were Normoxemic at the time of discharge, 7% (2 patients) were discharged with home oxygen and 13% (4 patient) died during hospital stay. The average length of stay in RICU was 6 to 15 days (46%).



STRENGTH AND LIMITATIONS – A good RICU, well trained nurses and paramedics are the strength of the study. The study group of 30 is small, so a further study with a large number of patients is warranted.

CONCLUSIONS – In our study, Age > 60 years, Male sex, a diagnosis of COPD, longer duration of Smoking, alcoholism, history of previous hospitalisation and poor ventilation seem to have a deleterious influence on the outcomes of Obstructive Airway Disease patients in RICU. All 4 deaths occurred in patients with above factors. Earlier use of Domiciliary oxygen and type of cooking fuel seem to have no influence on the outcome.

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