Journal of Health Care Research

Journal homepage: https://jhcr.journals.ekb.eg

P-ISSN **3009-6588**

E-ISSN **3009-7541**

Nurses' Knowledge and Practice Regarding Oxygen Therapy for Patients with Chronic Obstructive Pulmonary Disease

Eman Abd Alhakim Abd Allatif [1], Reda Dardier Hussein [2], Islam Mokhtar Mokhtar [3]

[1]Clinical Instructor at Medical Surgical Nursing Department Faculty of Nursing / Beni-Suef University.

[2] Lecturer of Medical Surgical Nursing Faculty of Nursing – Beni-Suef University

[3]Assistant Professor of Medical Surgical Nursing Faculty of Nursing – Beni-Suef University.

ABSTRACT

Background : Chronic obstructive pulmonary disease is a chronic respiratory disease defined by persistent airflow restriction as a result of damage induced by prolonged exposure to noxious particles or gases. Nurses are essential in providing care for COPD patients. The nurse should understand the basic concepts, indications, application methods, and consequences of oxygen therapy. Appropriate oxygen therapy can save lives, with a recommended target saturation of 88%-92% and no caveat for hypercapnia. The purpose of this study was to assess nurses' knowledge and practice with oxygen therapy for COPD patients. Research design: A descriptive research design was used. **Setting :** The current study was conducted at Chest Department and ICU Chest at Beni-Suef University Hospital and Chest Hospital at Beni –Suef Governorate. **Subject :** Convenience sample (114) of all available staff nurses (males & females) was used in current study , who are working in the previously mentioned settings .**Tools for data collection :** two tools were used to collect data; nurses self –administered questionnaire and nurses' Observation checklist. **Result :** The study revealed that (65.8%) of the studied nurses were aged between 20 and 30 years and (59.6%) of the studied nurses had technical nursing institute. About **(65.8%)** of the studied nurses had unsatisfactory levels of knowledge and (85.1%) of the studied nurses had incompetent level of practice regarding oxygen therapy . **Conclusion:** There were highly statistically significant differences between the studied nurses' knowledge and their practices regarding O_2 therapy for COPD patients. **Recommendation:** Researchers should design a study about effect of nose and mouth inflammation on efficiency of oxygen therapy for patients with COPD.

Keywords: Nurses' Knowledge and Practices, Oxygen Therapy, Chronic Obstructive Pulmonary Disease.

INTRODUCTION

Chronic obstructive pulmonary disease (COPD) produces progressive airflow restriction, typically as a result of airway or alveolar abnormalities caused by toxic gas or particle exposure. COPD causes high rates of disability, morbidity, and mortality , putting a strain on society, families, and people. COPD is becoming more common year after year, particularly among the young, yet the elderly remain the majority. The World Health Organization (WHO) reports that COPD is one of the top 10 causes of death worldwide **(Hu et al., 2022; Al Wachami et al., 2024).**

COPD prevalence is expected to increase over the next 30 years due to aging populations in wealthy countries and rising smoking rates in poorer countries. By 2030, COPD and related illnesses will kill over 4.5 million people annually (**Sayed , Ahmed & Salah, 2022).**

There is no cure for this chronic illness, which affects up to one in every ten persons. Common COPDBreathlessness, coughing, and sputum production are among the symptoms. Each patient's natural course of COPD is unique; nonetheless, in many cases, it includes times of increasing symptoms, known as exacerbations, that necessitate extra medication. These exacerbations cause higher mortality, lower quality of life, and increased need for health care services, and they represent a huge burden for patients and society **(Erdal , 2021).**

Chronic obstructive pulmonary disease is associated with a wide range of consequences, including dyspnea with no substantial influence on activity level and complete incapacity to perform daily tasks due to dyspnea. According to statistics, more than 70% of COPD patients have difficulty performing daily tasks, and patients with severe COPD may experience dyspnea and early exhaustion while simply strolling at home. As a result, COPD may cause an incapacity to carry out social tasks effectively, dependence on others, and mental health issues like loneliness, despair, anxiety, and fear **(Sami et al., 2021).**

Oxygen is one of the most widely used medications in pre-hospital and emergency settings. Oxygen therapy (OT) is one of the most successful and safe medications utilized in the healthcare system. OT, like pharmacological treatment, should be administered by nurses based on the physician's documented order, treatment protocol, and goal oxygen saturation. Because oxygen supplied at concentrations greater than those in the ambient air will help to enhance carbon dioxide excretion, oxygen saturation, or both **(Demrile & Kazan., 2020) .**

Current guidelines recommend administering it with a specific oxygen saturation rate and regular monitoring of

patient response, albeit this is mostly based on individual research and expert opinion. In the setting of COPD, regulated supplemental oxygen (rather than high-flow oxygen) is often adequate to overcome hypoxia caused by an AECOPD (Acute Exacerbation Chronic Obstructive Pulmonary Disease) and avoid hypercapnic respiratory failure and respiratory acidosis **(Kopsaftis et al.,2020) .**

Oxygen therapy, like any other medicine, is harmful to the human body, and larger amounts of oxygen can cause life-threatening health complications. The most common serious illness that can result from elevated oxygen levels is "oxygen toxicity." In individuals with COPD, high inspired supplementary oxygen levels can result in hypercapnia, acidosis, and increased mortality. This strategy deviates from recommendations for oxygen therapy titrated at a target SpO2 of 88–92% **(Jensen et al.,2024) .**

Nurses with particular expertise can effectively support patients with chronic, life-limiting illnesses like COPD. According to patients, nurses take more time to explain things than doctors do, which creates a more relaxed atmosphere and boosts their clinical confidence. Patients are encouraged to take care of their chronic diseases on their own. Basic concepts, indications, application techniques, OT complications, and the underlying causes of hypoxemia should all be understood by the nurse. The nurse should also be able to document the steps taken to address the patient's nursing care needs **(Kivuti-Bitok et al., 2024).**

Significance of the study

As the fourth leading cause of death worldwide, chronic obstructive pulmonary disease is considered a global health concern with particular significance because of its high mortality and morbidity. It is projected that COPD will rank as the third leading cause of mortality globally by the end of 2020, and that the disease burden will rise progressively over the ensuing decades as a result of population aging and ongoing exposure to risk factors for COPD **(Ricardo et al.,2021).**

Oxygen therapy can be very helpful and is frequently recommended for the treatment of COPD. For COPD patients to receive the best results, nurses are essential in administering oxygen therapy. In addition to doing a comprehensive nursing assessment, nurses closely monitor and observe the patient's hemodynamic status before starting oxygen therapy. If oxygen is being supplied concurrently, they also carefully check for proper flow. Therefore, it is critical to evaluate the nurses' behaviors and expertise regarding oxygen therapy for patients with COPD **(Demilew et al.,2022)**

COPD prevalence is estimated to reach 10.6% for both men and women by 2020, accounting for 480 million cases worldwide. According to forecasting, the number of COPD cases will increase by

23.3% from 2020 to 2050, from 112 million to 592 million (9.5% of the total eligible population). Low- and middle-income nations account for more than 90% of COPD-related fatalities **(Boers et al., 2023).**

COPD is very common in Egypt, affecting roughly 7.5% of the population. Men are more likely to have COPD than women, and the risk increases with age. Several factors contribute to Egypt's high prevalence, including widespread smoking, air pollution, and occupational exposure. About 25% of the population smokes, making it the most significant risk factor **(Atef , Abd Elkader & Awadeen, 2023).**

According to the statistical office of Beni-Suef University Hospital, in Beni-Suef city, the number of COPD patients admitted to the chest department was 100, with about 143 patients admitted to the ICU chest by 2023. From the beginning of the year 2024 to September 2024, about 97 and 150 COPD patients were admitted to the chest department and ICU chest, respectively, and patients received different methods of OT **(The Statistical Office of Beni-Suef University Hospital , 2023) &(The Statistical Office of Beni-Suef University Hospital , 2024).**

AIM OF THE STUDY

This study aimed to evaluate nurses' knowledge and practice regarding oxygen therapy for patients with chronic obstructive pulmonary disease**.**

Research questions

1. What was the nurses' level of knowledge regarding oxygen therapy for patients with chronic obstructive pulmonary disease?
2. What was the nurses' level of practice regarding oxygen therapy for patients with chronic obstructive pulmonary disease?
3. Is there any relationship between nurses' knowledge and practice regarding O2 therapy for patient with chronic obstructive pulmonary disease?

SUBJECTS AND METHODS

I- Technical design:

Technical design included : setting, subject and tools of data collection.

Research setting:

The current inquiry was carried out in the intensive care unit and chest department. Beni-Suef University Hospital has two chest units, and the Beni-Suef Governorate has a chest hospital. One of the specialty medical facilities in Beni-Suef City is Beni-Suef University Hospital, a seven-story structure with two dozen primary departments and eleven multiservice units. The six-story chest department has four rooms with 14 beds and an intensive care unit. The six-story chest has five rooms with a total of twelve beds. One of the specialist medical facilities in Beni-

Suef City is the Chest Hospital in Beni-Suef Governorate. It is a three-story structure with seven primary departments and eleven multiservice units. The location of the Chest department. The Chest department is located in the second floor, consists of two rooms contain 40 beds 20 in each room male and female and ICU Chest was located in the third floor, consists of one room contain 10 beds.

Subjects:

Sample type: A convenience sample of all employees nurse, both male and female, that is available 114 nurses who work in the aforementioned settings, provide direct nursing care, and have direct patient contact were used in the current study. They consented to participate, and the study ran from August 2023 to January 2024.

2- **Sample size:** All 114 nurses who work in the previously mentioned settings—54 at Beni-Suef University Hospital and 60 at Chest Hospital in the Beni-Suef Governorate—were included in the current study.

Tools of data collection:

To achieve the aim of the current study, two tools were used for collection of data;

I. Self-Administrative Questionnaire : It was adapted from **Hendawy, (2017),** it was translated into Arabic this tool consists of two parts

Part I: Socio-demographic characteristics, this part covered **(9 items)** related to personal data about nurses such as **(sex, age, educational level, experience, professional, place of work, previous training courses, marital status and residence).**

Part II: questionnaire related to nurses' knowledge about O2 therapy aims to identify **(information about Pathophysiology of respiratory system, COPD, oxygen, oxygen therapy, complication of OT delivery devices) .**

It is consist of three section :

Section 1 : include knowledge about the anatomical structure and function of respiratory system , it consist of **(6 items) .**

Section 2 : include knowledge about nurses' information about chronic obstructive pulmonary disease , it consist of **(6 items) .**

Section 3 : include knowledge about nurses' information about oxygen and oxygen therapy , it consist of **(22 items) .**

❖ **Scoring system:**

Answers were MCQ with total score (34mark) the correct answer was scored "1", while the incorrect answer was scored zero.).

The total knowledge score was further divided into:

- **satisfactory** level of knowledge when **≥75%**
- **unsatisfactory** level of knowledge when **<75%**

II. **Oxygen therapy observation checklist:** This check list was adapted from **Hendawy, (2017),** aims to monitor and assess nurses' level of practice regarding O2 therapy for COPD patients. This observation checklist was including such procedures as oxygen administrators via **(simple mask, aerosol mask, venture mask, nasal cannula and mechanical ventilator)**

❖ **Scoring system:**

Each items was scored by done correctly= 2 , done incorrectly = 1 or not done=zero.

The total practice score level further divided into the following:

- **competent** level when **≥90%**
- **incompetent** level when **<90%.**

II . Operational design:

The operational design includes preparatory phase, pilot study , content validity, reliability , field work and associated limitations .

preparatory phase:

It includes reviewing of related literature and studies related to present study using national and international resources.

Content validity:

A group of five experts in medical surgical nursing department specialties, all of whom were assistant professors of medical surgical nursing at Beni-Seuf University's Faculty of Nursing, created the revised instruments. They evaluated the instruments for clarity, relevance, thorough comprehension, applicability, and ease of administration in order to gauge their validity. The required change was made in accordance with that. Some minor changes were made. Ultimately, the completed forms were created.

Reliability of the tools

The reliability for the study was calculated by: The Cronbach Alpha was computed for both knowledge (0.723) and practice (0.867) in order to verify the reliability of the questionnaire through two test-retests of the instrument's pilot on the same population. The Cronbach alpha was not higher than the suggested value of 0.7.

Pilot study:

Eleven nurses participated in the pilot study, which was carried out to make sure the questions were clear and the tools were applicable, clear, and efficient. Evaluation of the viability of fieldwork, the amount of time required to do it, and the identification of any potential roadblocks that could impede the investigator's ability to gather data. Adjustments were made in accordance with the pilot study's findings. The pilot study's sample made up 10% of the entire sample. Participants in the pilot study were not included in the final sample size.

Fieldwork:

- Approximately six months were spent gathering the data, from August 2023 to January 2024.
- The researcher worked two days a week (Saturday and Monday), from 9:00 am to 1:00 pm, with an average of two to three nurses each day, in the study setting (chest department and ICU chest) at Beni-Suef University Hospital and Chest Hospital in Beni-Suef Governorate.
- Initially, the researcher gave a brief introduction to the nurses under study and explained the purpose and nature of the study before each interview.
- Each nurse was interviewed separately by the researcher after getting written agreement to participate in the study in accordance with ethical considerations.
- In order to help the nurse understand any questions that were unclear or challenging, the researcher assisted them in filling out the questionnaire.

Limitations of the Study

Many obstacles faced the researcher during this study, including:

- Due to their busy schedules or the admission of a new patient, some nurses refused to take part in the study at this time.
- It wasn't easy to collect all the nurses together at the same time.

III-Administrative design:

The Beni-Suef University Faculty of Medicine's Research and Ethics committee gave its approval. Beni-Suef University's faculty of nursing director provided formal consent in the form of a written letter outlining the study's goals and context.The Beni-Suef University Hospital's director received a second formal letter outlining the study's title and purpose, requesting permission to carry it out.

Ethical consideration:

Prior to the fieldwork, the Scientific Research Ethical Committee of Beni-Suef University's Faculty of Medicine granted ethical approval for the nurses' data collecting. Following a discussion and clarification of the study's goals, objectives, and anticipated results, each participant provided written consent to participate. Participants were given the freedom to decide whether or not to engage in the study, as well as the ability to withdraw from it at any moment without providing a reason, and their anonymity and confidentiality were guaranteed. They guarantee that every piece of information collected will be kept private and utilized exclusively for research.

IV. Statistical design

The statistical program for social sciences (SPSS 22.0) was utilized to assess the collected data for descriptive statistics in the form of frequencies and percentages for categorical variables. Means and standard deviations were used for continuous

variables. The Pearson correlation coefficient (r) was used to quantify the relationship between numerical variables. Chi square testing ($\chi 2$) was used to determine the correlation between categorical variables. $P<0.05$ was used as the significance level.

RESULTS

Table (1) demonstrated that. In terms of age, gender, and training, less than two-thirds of the nurses in the study were female, between the ages of 20 and 30, and had completed an oxygen therapy training course. Their mean and SD age was 28.56±4.76, respectively. According to their marital status, educational background, department of employment, and years of experience, more than half of the nurses in the study were married, had attended a technical nursing institute, worked in the chest department, and had less than five years of experience, with a mean and SD of (mean ± SD = 4.67±2.84) years (56.1% - 59.6% - 57.9% - 58.8%). In terms of where they lived, less than three-quarters (72.8%) of the nurses in the study were from rural areas.

Table(2) concluded that the mean percent (68.1%) of the nurses in the study had an inadequate degree of knowledge about oxygen therapy for patients with COPD, and the total mean±SD score was (mean ± SD = 23.16±4.48). In terms of knowledge dimensions, the respiratory system's anatomy and function had the highest mean percentage (76.7%), whereas oxygen therapy had the lowest mean percentage (66.2%).

Table (3): displayed that , about **(65.8%)** less than two thirds of studied nurses had unsatisfactory knowledge levels.

Figure (1): demonstrated that , 64.8% of the nurses in the study had inadequate understanding of oxygen therapy for patients with COPD, 34.2% of them had adequate knowledge.

Table (4) : concluded that the mean percent (77.8%) indicated an inadequate level of practices, while the overall mean and SD score of the nurses' practices for oxygen therapy for patients with COPD were (mean ±SD183.64±5.52). In terms of practice aspects, pre-oxygen therapy had the highest mean percentage (98.3%), whereas oxygen therapy using a venturi mask had the lowest mean percentage (73.2%).

Table (5) : illustrated that , (85.1%) the majority of studied nurses had incompetent level of practice regarding oxygen therapy , while (14.9%) the minority of studied nurses had competent level of practice .

Figure (2): showed that , (85.1%) the majority of studied nurses had incompetent level of practice regarding oxygen therapy , while (14.9%) the minority of studied nurses had competent level of practice .

Table (6): showed that there was highly statistically significant correlation between total score of knowledge of the studied

nurse's according to their total score of practice (P = 0.000**).

Table (7) illustrated that , there were highly statistically significant relation between level of knowledge and their age and gender (P = 0.002**) & (P = 0.006**) respectively . Also , there were statistically significant relation between level of nurse's knowledge and educational level (P = 0.031*) . While, there were no significant relation between level of knowledge and their marital status , residence , years of experience and training courses (P = 0.131 , P = 0.132 , P = 0.528 , P = 0.083 , P = 0.486) respectively

Table (8) summarized that there was highly statistically significant relation between level of nurse's practice and their marital status (P = 0.000**) and there was statistically significant relation between level of nurse's practice and their educational level (P = 0.017*) . While, there were no significant relation between level of total practice and their age, gender, residence , working department , years of experience and training courses (P = 0.651 , P = 0.304 , P = 0.465 , P = 0.224 , P = 0.637 , P = 0.656) respectively .

Table (1): Frequency distribution of studied nurses' socio-demographic characteristics (n=114).

Socio-Demographic Characteristics	No.	%
Age (years)		
– 20 < 30	75	65.8
– 30 < 40	20	17.5
– 40 < 50	9	7.9
– 50 < 60	10	8.8
Mean±SD	*28.56±4.76*	
Gender		
– Male	39	34.2
– Female	75	65.8
Marital status		
– Single	41	36
– Married	64	56.1
– Divorced	7	6.1
– Widow	2	1.8
Residence		
– Rural	83	72.8
– Urban	31	27.2
Nursing Qualifications		
– Diploma in Nursing	19	16.7
– Specialized Program	8	7
– Nursing Technical Institute	68	59.6

– Bachelor of Nursing	19	16.7
Working Unit		
– Chest Unit	66	57.9
– Chest ICU	48	42.1
Experience (years)		
– < 5	67	58.8
– 5< 10	28	24.6
– 10 < 15	19	16.6
Mean±SD	*4.67±2.84*	
Training about Oxygen Therapy		
– Yes	74	64.9
– No	40	35.1

Table (2) Overall mean score of studied nurses' knowledge regarding oxygen therapy for patients with COPD (n=114)

Knowledge Dimensions	Range	Mean±SD	Mean (%)	Rank
– Anatomy and function of respiratory system	0 – 6	4.60±1.31	76.7	1
– Knowledge regarding COPD	0 – 6	4.01±1.21	66.8	2
– Oxygen therapy	0 – 22	14.56±3.22	66.2	3
Overall knowledge	0 – 34	23.16±4.48	68.1	

Table (3): Frequency distribution of studied nurses' knowledge levels regarding oxygen therapy for patients with COPD (n=114).

Nurses' Knowledge Levels	Unsatisfactory (<75%)		Satisfactory (≥75%)	
	No.	%	No.	%
– Anatomy and function of respiratory system	39	34.2	75	65.8
– Knowledge regarding COPD	66	57.9	48	42.1
– Oxygen therapy	84	73.7	30	26.3
Nurses' Overall Knowledge Levels	**75**	**65.8**	**39**	**34.2**

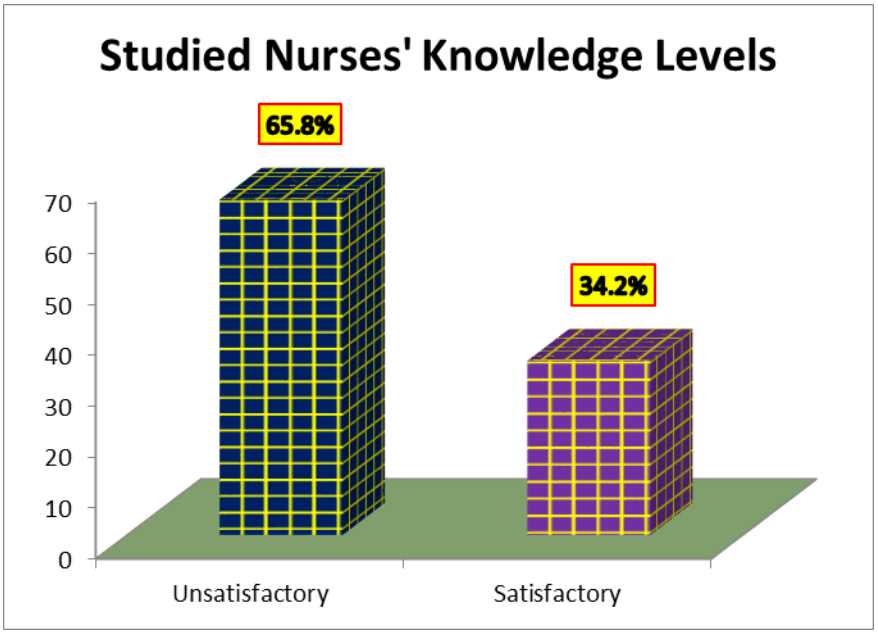

Fig.(1): Frequency distribution of studied nurses' knowledge levels regarding oxygen therapy for patients with COPD (n=114).

Tabel(4) overall mean score of studied nurses' practices regarding oxygen therapy for patients COPD (n=114)

Practice Dimensions	Range	Mean±SD	Mean(%)	Rank
– Pre-oxygen therapy	0 – 22	21.63±1.14	98.3	1
– Oxygen therapy via aerosol mask	0 – 48	37.73±1.53	78.6	2
– Oxygen therapy via nasal cannula	0 – 40	29.85±0.99	74.6	4
– Oxygen therapy via venture mask	0 – 38	27.81±0.93	73.2	6
– Oxygen therapy via simple mask	0 – 42	32.64±1.31	77.7	3
– Oxygen therapy via MV	0 – 46	33.96±1.05	73.8	5
Overall Practice	0 –236	183.64±5.52	77.8	

Table (5): Frequency distribution of studied nurse' practices levels regarding oxygen therapy for patients COPD (n=114).

Nurses' Practice Levels	Incompetent(<90%)		Competent (≥90%)	
	No.	%	No.	%
– Pre-oxygen therapy	10	8.8	104	91.2
– Oxygen therapy via aerosol mask	99	86.8	15	13.2
– Oxygen therapy via nasal cannula	101	88.6	13	11.4
– Oxygen therapy via ventyri mask	96	84.2	18	15.8
– Oxygen therapy via simple mask	91	79.8	23	20.2
– Oxygen therapy via MV	95	83.3	19	16.7
Nurses' Overall Practice Levels	**97**	**85.1**	**17**	**14.9**

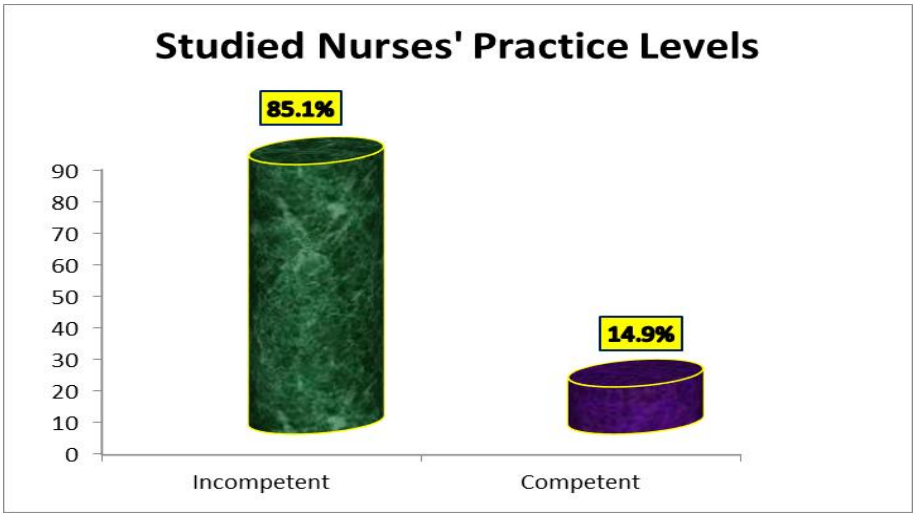

Fig.(2): Frequency distribution of studied nurse' practices levels regarding oxygen therapy for patients COPD (n=114).

Table (6): Correlation between studied nurses' knowledge and their practice regarding oxygen therapy for patient with COPD *(n=114)*

Variables		Total Practice
Total Knowledge	*R*	0.453
	P-Value	0.000**

Table (7): Relation between studied nurses' socio-demographic characteristics and their knowledge regarding oxygen therapy for patient with COPD (n=114).

	Knowledge Levels		

	Unsatisfactoy		Satisfactory		χ^2	P-value
	No.	%	No.	%		
Age						
– 20 < 30	41	36	34	29.8	**14.53**	**0.002****
– 30 < 40	18	15.8	2	1.8		
– 40 < 50	6	5.3	3	2.6		
– 50 < 60	10	8.8	0	0		
Gender						
– Male	19	16.7	20	17.5	**7.67**	**0.006****
– Female	56	49.1	19	16.7		
Marital Status						
– Single	24	21.2	17	14.9	**5.63**	**0.131**
– Married	42	36.8	22	19.3		
– Divorced	7	6.1	0	0		
– Widow	2	1.8	0	0		
Residence						
– Rural	58	50.9	25	21.9	**2.26**	**0.132**
– Urban	17	14.9	14	12.3		
Nursing Qualifications						
– Diploma in Nursing	13	11.4	6	5.3	**8.87**	**0.031***
– Specialized Program	2	1.8	6	5.3		
– Nursing Technical Institute	44	38.6	24	21.1		
– Bachelor of Nursing	16	14	3	2.6		
Working Unit						
– **Chest Unit**	**45**	**39.5**	21	18.4	**0.399**	**0.528**
– **Chest ICU**	**30**	**26.3**	18	15.8		
Years of Experience						
– < 5	39	34.2	28	24.6	**4.97**	**0.083**
– 5 < 10	20	17.5	8	7		
– 10 < 15	16	14	3	2.6		
Training						
– Yes	47	41.2	27	23.7	**0.485**	**0.486**
– No	28	24.6	12	10.5		

Table (8): Relation between studied nurses' socio-demographic characteristics and their practice regarding oxygen therapy for patient with COPD (n=114).

	Practice Levels		

Socio-demographic Characteristics	Incompetent		Competent		χ^2	P-value
	No.	%	No.	%		
Age						
– 20 < 30	74	64.9	1	0.9	**1.63**	**0.651**
– 30 < 40	19	16.7	1	0.9		
– 40 < 50	9	7.9	0	0		
– 50 < 60	10	8.8	0	0		
Gender						
– Male	39	34.2	0	0	**1.05**	**0.304**
– Female	73	64	2	1.8		
Marital Status						
– Single	41	36	0	0	**27.88**	**0.000****
– Married	63	55.3	1	0.9		
– Divorced	7	6.1	0	0		
– Widow	1	0.9	1	0.9		
Residence						
– Rural	82	71.9	1	0.9	**0.535**	**0.465**
– Urban	30	26.3	1	0.9		
Nursing Qualifications						
– Diploma in Nursing	19	16.7	0	0	**10.17**	**0.017***
– Specialized Program	8	7	0	0		
– Nursing Technical Institute	68	59.6	0	0		
– Bachelor of Nursing	17	14.9	2	1.8		
Working Unit						
– Chest Unit	64	56.1	2	1.0	**1.48**	**0.224**
– Chest ICU	48	42.1	0	0		
Years of Experience						
– < 5	66	57.9	1	0.9	**0.902**	**0.637**
– 5 < 10	27	23.7	1	0.9		
– 10 < 15	19	16.7	0	0		
Training						
– Yes	73	64	1	0.9	**0.199**	**0.656**
– No	39	34.2	1	0.9		

DISCUSSION

Chronic obstructive pulmonary disease (COPD) is a group of disorders that cause airflow limitation and difficulty breathing. These include chronic bronchitis and emphysema. Tobacco usage is the main factor contributing to the onset and progression of COPD. COPD is a leading cause of chronic illness and is predicted to go up from the fourth to the third largest cause of death globally by 2020. Over three million people globally die from COPD each year, and the disease's incidence is predicted to increase over the coming decades as treatments for associated comorbidities

improve and exposure to tobacco, environmental biomass fuel, and air pollution continue **(Ammous et al.,2023).**

referring to the demographic characteristics of the nurses participating in this study. The study found that less than two-thirds of nurses were female and aged 20-30 (mean+SD age: 28.56±4.76). This could be because more than half of the nurses had less than five years of experience and had recently graduated; the younger age group is often assigned to work in the critical unit. Furthermore, the nurses under research were female, which could be because the nursing profession in Egypt was traditionally reserved for women before being expanded to both sexes. Women work in nursing at a higher rate than men.

This study finding was inaccordance with **ELgneid , Sherief & Nabih, (2020)** , , who mentioned that less than three quarters were aged between 20 and 30 years with mean± SD age (26.6 ± 4.4), which entitled" effect of implementing oxygen administration guidelines on nurses' performance caring for patients with chest disorders ". Additionaly this study results supported with **Mohammed, Hassan,& Fathy.(2022) ,** who showed that more than half of the studied nurses were aged between 25 and 35 years old with mean ± SD age (38.1± 9.10) which entitled " nursing guidelines regarding safe and effective practices of supplemental oxygen therapy among critically care patients. more than three quarters "

Conversely, This study finding disagreed with **Bizuneh et al.,(2022)** , who mentioned that more than half of studied nurses were within age group ٣5-٣9 years. which entitled "assessment of knowledge, attitude, and factors associated with oxygen therapy for critically ill patients among nurses at the university of gondar comprehensive specialized hospital northwest, ethiopia " .

This study finding was agreed with **Iradukunda , (2022).** who mentioned that more than two thirds of studied nurses were female which entitled " assessment of nurse's knowledge and practices for critical patients under oxygen-therapy at mugonero adventist hospital " , Additionaly with **Nigatu , Debebe & Tuli .(2022).** who mentioned that more than two half of studied nurses were female , which entitled " assessment of knowledge, practice, and associated factors towards airway and breathing management among nurses working in the emergency departments of selected public hospitals in addis ababa, ethiopia " .

While this study finding different with **Radhi & Arar .(2021).** , who showed that less than half of studied nurses were female while less than two thirds were male . Which entitled " nurse's knowledge concerning

oxygen therapy toxicity at misan governorate hospitals in iraq" .

Pertaining to marital status, the study results showed that, more than half of studied nurses were married . From the researcher's point of view, this may be due to that less than two thirds of the studied nurses were aged between 20 and 30 years and this age was marital age, this study findings were supported by **Bizuneh et al., (2022)** , who mentioned that more than two thirds of studied nurses were married .

Additionally this finding was in the same line with **Getahun et al., (2022)** , who showed that more than two thirds of studied nurses were married , this finding was mismatched with **Kadhim& Juma, (2021).**which entitled " Assessment nurses knowledge toward oxygen therapy Administration for Patients with COVID-19 at Intensive Care Unit and Isolation Unit in AL-Hussein Teaching Hospital in AL-Smawa City/Iraq" and showed that the majority of studied nurses were married .

Regarding residence, the results of the current study detected that, less than three quarters of the studied nurses lived in rural area .This finding was agreed with **Labieb et al., (2020).** Who mentioned that, more than three quarters of the studied nurses lived in rural areas , which entitled " impact of implementing nursing protocol on respiratory function of elderly patients' with chronic obstructive pulmonary disease".

Meanwhile this finding was rejected with **Latif et al., (2021).** Who found that less than three quarters of studied nurses lived in urban area , which entitled " knowledge of nurses regarding respiratory physical assessment in tertiary hospital Lahore, Pakistan" ,

According to the study's findings, over half of the nurses who were examined had attended a technical nursing institute. From the perspective of the researcher, this is because technical nursing institutes supply more graduates to health agencies than nursing faculties, which may further explain the current state of nursing education, as bachelor's degree holders tend to work as administrators rather than practitioners.

This study findings in the same line with **Hassan , Abdelaziz & Elmwafie. (2024).** who mentioned that less than two thirds of studied nurses had technical nursing institute . Which entitled " Quality of Nursing Performance regarding Oxygen Administration for High Risk Infant". Additionaly this finding was aggred with **Mostafa , Mehany & Ahmed, (2019)., (2019)** , who mentioned that the minority of studied nurses had technical nursing institute.

On the othe hand this finding was different with **Diab et al., (2022).** which entitled " Effectiveness of standardized protocol for oxygen therapy on improving nurses' performance and patients' health outcome ". who mentioned that, the

majority of studied nurses was bachelor of nursing . Also this study findings disagreed with **Iradukunda, (2022).** who mentioned that, over half of the nurses that were studied have nursing diplomas. which entitled " assessment of nurses's knowledge and practices for critical patients under oxygen-therapy at mugonero adventist hospital (doctoral dissertation, kibogora polythechnic)" .

Concerning years of experience the result of current study found that more than half of studied nurses had less than 5 years of experience with mean±SD was (4.67±2.84) years . In my opinion , this may be due to in the ICU have a variety of nurses with different years of experience to fulfill different duties required in this specialized unit. because of large numbers of studied nurses showed that less than two thirds of the studied nurses were aged between 20 and 30 years , so they have few years of experience .

This study findings was agreed with **ELgneid , Sherief & Nabih, (2020)** , who stated that over half of the nurses in the study had less than five years of experience, with mean ± SD were (5.7 ± 4.6) years .Also the current study findings supported with **Yassin & Mansour, (2021).** Who illustrated that less than two thirds of studied nurses had less than 5 years of experience , which entitled " assessment of nurse's knowledge and practice regarding oxygen therapy at teaching hospitals in al-nasiriya city\iraq" .

In contrary with **Kalpana et al., (2021)** , who mentioned that less than two thirds of studied nurses had more than 5 years of experience, which entitled " nursing awareness of oxygen therapy among nurses at selected district hospital in nepal". Additionally the study findings agreed with **Argeta , Bezabih& Kebede.(2022),** who mentioned that the meniority of studied nurses had more than 5 years of experience , while less than two thirds of studied nurses had more 11years to 30 years of experience . Which entitled " assessment of knowledge, attitude and practice of nurses towards oxygen therapy at wolaita sodo university comprehensive teaching and referral hospital, ethiopia".

According to the study's findings, fewer than two-thirds of the nurses who were surveyed had taken an oxygen therapy training course intended for patients with COPD. According to the researcher, this discovery might be the result of the hospital's lack of a continuing education department and the nurses' low enthusiasm for receiving training on oxygen therapy for patients with COPD in the intensive care unit and chest units.

This finding was in accordance with **Hassan , Abdelaziz & Elmwafie .(2024).** Who revealed that over half of the nurses in the study had completed an oxygen treatment training course, which entitled "quality of nursing performance regarding oxygen administration for high risk infant". Also this

study finding supported with **Radhi & Arar .(2021**), who showed that more than half of studied nurses had training course regarding oxygen therapy.

Meanwhile This result was not in line with **Mostafa , Mehany & Ahmed, (2019)., (2019**). which entitled " effect of educational program on nurses' knowledge and practice about oxygen therapy" and mentioned that almost all studied nurses had not training course regarding oxygen therapy.

Concerning total mean score of the studied nurse's level of knowledge regarding oxygen therapy for patients with chronic obstructive pulmonary disease , this study results found that total mean±SD of the studied nurse's level of knowledge regarding oxygen therapy for patients with COPD was (23.16±4.48), this study result aggred with

Meanwhile this study results different with **Desalu et al.,(2022) ,** who demonistrated that total mean±SD of the studied nurse's level of knowledge regarding oxygen therapy for patients with COPD was (14.75 ± 2.83)**.** Which entitled " doctors' and nurses' knowledge and perceived barriers regarding acute oxygen therapy in a tertiary care hospital in Nigeria ".

Regarding to nurses' total level of knowledge about oxygen therapy for COPD patients

According to the study's findings, less than two-thirds of the nurses who were the subject of the investigation had an inadequate degree of overall knowledge. This, in my opinion, might be because nurses are not motivated or knowledgeable enough to provide evidence-based or specialty care because they are not attending training courses or programs related to this topic, are not being supervised, have not attended orientation programs before starting work, have not attended care conferences while working, and lack guidance. These result was similar with **Teshale et al., (2024).** Who reported that the majority of the studied nurses had unsatisfactory total level of knowledge about nurses' total level of knowledge about oxygen therapy. Which entitled " oxygen therapy practice and associated factors among nurses working at an Ethiopian Referral Hospital".

Additionly this study result was supported with **Katel et al., (2021)** who found that near to three quarters of the studied nurses had unsatisfactory level of total knowledge about oxygen therapy. Who conducted a study about "nursing awareness of oxygen therapy among nurses at selected district hospital in nepal".

Also in the same line with **Desalu et al., (2022).** Who reported less than three quarters of the studied nurses had unsatisfactory total level of knowledge about nurses' total level of knowledge about oxygen therapy . Moreover this study finding agreed with **Kalpana et al., (2021).** who mentioned that less than three quarters of the studied nurses had unsatisfactory total level of knowledge

about nurses' total level of knowledge about oxygen therapy

Meanwhile this study findings was disagreed with **Sharma & Soni , (2024)** , who showed that less than half of nurses had unsatisfactory total level of knowledge regarding oxygen therapy for patients with COPD , which entitled "A study to assess the knowledge regarding excess oxygenation hazardes and their preventive measures among nursing officers at spinph hospital ".

Also this study results different with **Demilew et al., (2022) ,** who showed that more than half of nurses had satisfactory total level of knowledge. Which entitled "knowledge, attitude, and practice of health professionals for oxygen therapy working in south gondar zone hospitals".

More over , this finding is contradicted with **Jamie . (2021) ,** It revealed that less than two-thirds of nurses knew enough about oxygen therapy for patients with COPD overall, which entitled " knowledge and practice of nurses towards oxygen therapy in the public hospitals of harari region".

In reference to the practice mean score of all nurses involved in the study about oxygen therapy for patients with COPD, the current study revealed that the practice mean score of all these nurses regarding oxygen therapy for COPD patients was 183.64±5.52.The findings of this investigation are consistent with **Mostafa , Mehany & Ahmed, (2019).** Who showed that total nurses' practice mean ± SD of the studied nurses about oxygen therapy was (97.9200 ± .39590). In addition to these study results supported with **Mohammed , Hassan & Fathy.(2022)** Who demonstrated that total nurses' practice mean score of the studied nurses about oxygen therapy was (99.5 ± 106.10) .

Meanwhile this study results disagreed with **Jamie, (2021) ,** who demonstrated how the current study revealed that the nurses' overall practice mean + SD for oxygen therapy for patients with COPD was (4.37±1.76) Additionally, the findings of this study differ with **Hassan, Abdelaziz & Elmwafie . (2024).** Who found that the total practice mean ±SD of the studied nurses about oxygen therapy was (2.57±1.62).

pertaining to the overall degree of practice of nurses with regard to oxygen therapy for patients with COPD. According to the current study's findings, the majority of the nurses who were examined had competent levels of practice when it came to administering oxygen treatment to patients with COPD, whereas the majority had incompetent levels. This could be caused by a variety of factors, in my opinion. For example, over half of the nurses who were studied were fresh graduates from nursing technical institutes with inadequate expertise, which resulted in poor practice.

Additionally, they lacked professional role models and guidance,

lacked an in-service training program before working in the chest department and intensive care unit, lacked experience in critical care units (more than half of the nurses in the study had less than five years of experience), lacked the supplies and equipment (such as sterile gloves, suction catheters, and personal protective equipment, or PPP) needed for proper application of certain OT procedures, and lacked professional role models and guidance.

The findings of this investigation matching with **Aloushan et al.,(2019) ,** who mentioned that the majority of the studied nurses had incompetent level of practice regarding oxygen therapy who conducted a study entitled " assessment of knowledge, attitude and practice regarding oxygen therapy at emergency departments in riyadh in 2017: a cross-sectional study " Also this study results supported with **Adeniyi , et al., (2021**). who mentioned that the majority of the studied nurses had incompetent level of practice regarding oxygen therapy. who conducted a study entitled "assessment of knowledge and practice of oxygen therapy among doctors and nurses" . Moreover this study result corresponding to **Teshale et al.,(2024)**. They demonstrated that the majority of nurses in the study practiced oxygen therapy in an incompetent manner.

Conversary this finding was incomparable with **Hassan , (2022).** Who indicated that almost two thirds of the studied nurses had a competent level of total practice regarding oxygen administration . Additionally with **Demilew et al.,(2022) ,** who showed that less than two thirds of the studied nurses had a competent level of total practice regarding oxygen administration.

With respect to the relationship between the total level of practice and the total level of knowledge of the nurses under study regarding oxygen therapy for patients with COPD, the current study found a highly statistically significant correlation between the two (P = 0.000**). According to the researcher, competent nursing practice rose as knowledge increased.

These study results matching with **Mostafa, Mehany & Ahmed, (2019)** whose results revealed that there were highly statistically positive correlation between total nurse' knowledge and practice. In their study entitled " effect of educational program on nurses' knowledge and practice about oxygen therapy".

Also, this study findings was in the same line with **Ghebremichael et al., (2019)** whose results revealed that there were highly statistically positive correlation between total nurse' knowledge and practice. In their study entitled " assessment of nurses’ knowledge, attitude and practice about oxygen therapy in emergency and icu departments of orotta national referral hospital " . Moreover this study findings accepted with **Shakor, (2019)** who conducted studied entitled "Knowledge

and practices of nurses regarding nebulization therapy" who illustrated that there was significant correlation between the total practices score and demographic data.

The current study noted that there was a highly statistically significant relationship between the studied nurses' total knowledge and educational level with regard to the relationship between their sociodemographic characteristics and their level of knowledge regarding oxygen therapy for COPD patients. Additionally, there was a statistically significant correlation between their age and gender and their overall knowledge level. However, there was no discernible correlation between the total nurses' knowledge level and their years of experience, training, marital status, or years of residence. According to the investigator, this could be because the analyzed nurses' educational attainment had an impact on their level of expertise.

These study results matching with **Radhi & Arar , (2021).** who indicates that The degree of nurses' understanding of oxygen therapy was significantly correlated with their (age & level of education). Additionally with **Kalpana et al.,(2021)** , who found that nurses' age and educational attainment were significantly correlated with their level of oxygen therapy knowledge.

This result in the same line with **Mayhob , (2018)** in his study entitled " Nurses' knowledge, practices and barriers affecting a safe administration of oxygen therapy in one of the educational hospitals in Cairo, Egypt " whose results revealed that there were statistically significant relations between level of knowledge of the studied sample and their age.

These study results, on the other hand, were in conflict with those of **Nagatu, Debebe &Tuli, (2022)**, who stated that there was a substantial correlation between nurses' understanding of oxygen therapy and their age and educational attainment. Furthermore, this study's findings differ from those of **Demilew et al., (2022),** who found a substantial correlation between nurses' years of experience and training courses and their degree of knowledge of oxygen therapy.Concerning to Relation between the studied nurses' socio-demographic characteristics and their practice regarding oxygen therapy for COPD patient the current study mentioned that there were highly statistically significant relation between level of nurses' total practice and their marital status and educational level. While, there were no significant relation between level of total practice and their age, gender, years of experience and training courses.

This, in my opinion, might be because the educational attainment of the nurses under study had an impact on the nurses' level of expertise.According to this result, nurses perform better the more qualified they are.The findings of the current

investigation are consistent with **Mostafa, Mehany & Ahmed . (2019).** Who mentioned that there was statistically significant relation between level of nurses' total practice and their educational level.

CONCLUSION

Based on the findings of the current study, it can be concluded that the majority of studied nurses had unsatisfactory knowledge and incompetent practices level about O2 therapy for COPD patients. Also, there were statistical significant differences between some of the socio-demographic characteristics of studied nurses and their knowledge about O2 therapy for COPD patients, such as level of education, age, and gender. Also, there were statistical differences between some of the socio-demographic characteristics of studied nurses and nurses' practices about O2 therapy such as marital status and level of education. Additionally, there were highly statistically significant differences between the studied nurses' knowledge and their practices regarding O2 therapy for COPD patients.

RECOMMENDATIONS

- Nurses must educate patients with COPD about smoking cessation strategies that could help increase smoking abstinence rates in COPD patients. These strategies should be multifaceted and include intensive counseling (such as telephone, group, and individual support), smoking quitting medication or nicotine replacement therapy, and health education.
- Develop practical guidelines for nurses to apply during the care of patients with COPD on oxygen therapy.
- Motivating nurses to pursue certified oxygen therapy training courses enhances aseptic technique in oxygen therapy for patients with COPD safety.
- Researchers should design a study about effect of nose and mouth inflammation on efficiency of oxygen therapy for patients with COPD.

REFERENCES

Al Wachami, N., Guennouni, M., Iderdar, Y., Boumendil, K., Arraji, M., Mourajid, Y., & Chahboune, M. (2024): Estimating the global prevalence of chronic obstructive pulmonary disease (COPD): a systematic review and meta-analysis. BMC Public Health, 24(1), P:297.

Aloushan, A. F., Almoaiqel, F. A., Alghamdi, R. N., Alnahari, F. I., Aldosari, A. F., Masud, N., & Aljerian, N. A. (2019): Assessment of knowledge, attitude, and practice regarding oxygen therapy at emergency departments in Riyadh in 2017: a cross-sectional study. world journal of emergency medicine, 10(2), P:88.

Ammous, O., Feki, W., Lotfi, T., Khamis, A. M., Gosselink, R., Rebai, A., & Kammoun, S. (2023): Inspiratory muscle training, with or without concomitant pulmonary rehabilitation, for chronic obstructive pulmonary disease (COPD). Cochrane Database of Systematic Reviews,(1).

Argeta,H., Bezabih, B.,& Kebede,E.(2022) : Assessment of Knowledge, Attitude and Practice of Nurses towards Oxygen Therapy at Wolaita Sodo University Comprehensive Teaching and Referral Hospital, Ethiopia, 2021 . Available at : https://www.ijocs.org . Accessed on20April.

Atef ,M, N., Abd Elkader , A, M., & Awadeen, L. (2023): Assessment Quality of Life for Patients with Chronic Obstructive Pulmonary Disease in Outpatients Clinic at Beni-Suef University Hospital. Egyptian Journal of Health Care, 14(4), PP:(554-577).

Bizuneh, Y. B., Getahun, Y. A., Melesse, D. Y., & Chekol, W. B. (2022): Assessment Of Knowledge, Attitude, And Factors Associated With Oxygen Therapy For Critically Ill Patients Among Nurses At The University Of Gondar Comprehensive Specialized Hospital Northwest, Ethiopia, 2021. Annals Of Medicine And Surgery, 80, P:104334.

Boers, E., Barrett, M., Su, J. G., Benjafield, A. V., Sinha, S., Kaye, L., ... & Malhotra, A. (2023): Global burden of chronic obstructive pulmonary disease through 2050. JAMA Network Open, 6(12), e2346598-e2346598.

Demilew, B. C., Mekonen, A., Aemro, A., Sewnet, N., & Hailu, B. A. (2022): Knowledge, attitude, and practice of health professionals for oxygen therapy working in South Gondar zone hospitals, 2021: multicenter cross-sectional study. BMC Health Services Research, 22(1), P:600.

Demrile, H., & Kazan, E. E. (2020): Knowledge levels of nurses about oxygen therapy in Turkey. International Journal of Health Services Research and Policy, 5(1), PP:(1-14).

Desalu, O. O., Ojuawo, O. B., Adeoti, A. O., Oyedepo, O. O., Aladesanmi, A. O., Afolayan, O. J., ... & Opeyemi, C. M. (2022): Doctors' and nurses' knowledge and perceived barriers regarding acute oxygen therapy in a tertiary care hospital in Nigeria. Advances in Medical Education and Practice, 13, P:1535.

Diab, S. S. E. M., Ali, S. A. A., Abed, S. N., Elasrag, G. A. E. A., & Ramadan, O. M. E. (2022): Effectiveness of Standardized Protocol for Oxygen Therapy on Improving Nurses' Performance and Patients' Health Outcome. International Journal of Environmental Research and Public Health, 19(10), P:5817.

Elgneid, H. A., Sherief, W. I., & Nabih, M. H. (2020): Effect of Implementing Oxygen Administration Guidelines on Nurses' Performance Caring For Patients with Chest Disorders. IOSR J Nurs Health Sci, 9, 49-55.

Erdal, M. (2021): Chronic obstructive pulmonary disease (COPD):exacerbations and costs. Avilable at: https://bora.uib.no .Accessed on 1/6 /2024 .

Getahun, Y. A., Bizuneh, Y. B., Melesse, D. Y., & Chekol, W. B. (2022): Assessment of practice and barriers of oxygen therapy in critically ill patients among nurses: a survey from University of Gondar comprehensive specialized hospital northwest, Ethiopia, 2021. Annals of Medicine and Surgery, 76, PP : (103481).

Ghebremichael, F. G., Thomas, L. M., Yohannes, A., Kesete, K., & Wolday, S. (2019) : Assessment of nurses' knowledge, attitude and practice about oxygen therapy in emergency and ICU departments of Orotta National Referral Hospital. Int J Med Health Prof Res,6 (1), P:104.

Hassan, H. A., Abdelaziz, F. S., & Elmwafie, S. M. (2024): Quality of Nursing Performance regarding Oxygen Administration for High Risk Infant. Journal of Health Care Research, 1(1), PP:(45-60).

Hassan, S. M. S. (2022): Nurses' knowledge and practice regarding supplemental oxygen therapy at Kirkuk city teaching hospitals/Iraq. Hiv nursing, 22(2), PP : (2999-3003).

Hendawy, H. M., (2017): Nurse's roles in managing patients with chronic obstructive pulmonary disease undergoing oxygen therapy. Thesis (m-SC) Medical Surgical Nursing, Faculty of Nursing at Ain Shams University,Egypt.

Hu, W., Li, T., Cao, S., Gu, Y., & Chen, L. (2022): [Retracted] Influence of Nurse-Led Health Education on Self-Management Ability, Satisfaction, and Compliance of Elderly Patients with Chronic Obstructive Pulmonary Disease Based on Knowledge, Belief, and Practice Model. Computational and Mathematical Methods in Medicine, 2022(1), P:1782955.

Iradukunda, D. (2022): Assessment of Nurses's Knowledge and Practices for Critical Patients under Oxygen-Therapy at Mugonero Adventist Hospital (Doctoral Dissertation, Kibogora Polythechnic)**.**

Jamie, A. (2021) : Knowledge and Practice of Nurses towards Oxygen Therapy in the Public Hospitals of Harari Region. Availableat : http://nmj.goums.ac.ir/article-1-1315-en.html. Accessed on 5 April 2024.

Jensen, A. S. R., Valentin, J. B., Mulvad, M. G., Hagenau, V., Skaarup, S. H., Johnsen, S. P., & Gude, M. F. (2024): Standard vs. targeted oxygen therapy prehospitally for chronic obstructive pulmonary disease (STOP-COPD): study protocol for a randomised controlled trial. Trials, 25(1), P:85.

Kadhim, H. A., & Juma, A. R. (2021): Assessment Nurses Knowledge toward Oxygen Therapy AdministrationfFor Patients with COVID-19 at Intensive Care Unit and Isolation Unit in AL-Hussein Teaching Hospital in AL-Smawa City/Iraq. Kufa Journal for Nursing Sciences, 11(1), PP:(9-15).

Kalpana, K., Sunita, G., Srijana, G., & Muna, B. (2021): Nursing awareness of oxygen therapy among nurses at selected district hospital in Nepal. Вестник Российского университета дружбы народов. Серия: Медицина, 25(3), PP(202-208).

Katel,K., Gurung, S., Gautam, S., &Bhattrai M.(2021): Nursing awareness of oxygen therapy among nurses at selected District Hospital in Nepal. RUDN journal of medicine. 25(3) pp:(202-208). doi: 10.

Kivuti-Bitok, L. W., Odhiambo, J., Omare, S., Mugo, C., Zgambo, M., & Ngune, I. (2024): Knowledge of oxygen therapy among nurses in a tertiary hospital in kenya: Implications for patient care and training needs. midwifery, 7(1), PP:(108-124).

Kopsaftis, Z., Carson-Chahhoud, K. V., Austin, M. A., & Wood-Baker, R. (2020): Oxygen therapy in the pre-hospital setting for acute exacerbations of chronic obstructive pulmonary disease. Cochrane Database of Systematic Reviews, (1).

Labieb, M., Mohamed, S., El-Aziz, A., Nermeen, M., Hassan, A., & Fahmy, H. (2020): Impact of Implementing Nursing Protocol on Respiratory Function Of Elderly Patients' With Chronic Obstructive Pulmonary Disease. Assiut Scientific Nursing Journal, 8(20.00), PP:(38-52).

Latif, S ., Perveen, K ., Sarwar,H ., & Khan,S. (2021) : Knowledge of Nurses Regarding Respiratory Physical Assessment in Tertiary Hospital Lahore, Pakistan.Avilable at:https://doi.org/10.53350/pjmhs2115102763. Accessed on 11/2/2024.

Mohammed, G., F., Hassan, H A., & Fathy, A T. (2022): Nursing guidelines regarding safe and effective practices of supplemental oxygen therapy among critically care patients. Available at: https://www.sciencedirect.com. Accessed on 12 April 2024.

Mostafa, A. H., Mehany, M. M., & Ahmed, M. A. E. (2019): Effect of Educational Program on Nurses'

Knowledge and Practice about Oxygen Therapy. Assiut Scientific Nursing Journal, 7(18),PP:(95-104).

Nagata, K., Horie, T., Chohnabayashi, N., Jinta, T., Tsugitomi, R., Shiraki, A., & Tomii, K. (2022): Home high-flow nasal cannula oxygen therapy for stable hypercapnic COPD: a randomized clinical trial. American Journal of Respiratory and Critical Care Medicine, 206(11), PP: (1326-1335).

Radhi, T. A., & Arar, A. A. (2021): Nurses'knowledge Concerning Oxygen Therapy Toxicity at Misan Governorate Hospitals in Iraq. Turkish Journal of Physiotherapy and Rehabilitation, 32(3), PP:(2651-3451).

Ricardo, J. A., Simões, J. A., & Santiago, L. M. (2021): Prevalence of chronic obstructive pulmonary disease in general practice patients in the Central Region of Portugal. Family Medicine and Primary Care Review, 23(2), PP:(220-223).

Sami, R., Salehi, K., Hashemi, M., & Atashi, V. (2021). Exploring the barriers to pulmonary rehabilitation for patients with chronic obstructive pulmonary disease: a qualitative study. BMC Health Services Research, 21, PP:(1-10).

Sayed, A. A. E. A., Ahmed, M. M., & Salah, H. (2022): Pattern of chronic obstructive pulmonary diseases in Nasser Institute, Egypt. The Egyptian Journal of Bronchology, 16(1), P;48.

Shakor, S. Q. (2019): Knowledge and practices of nurses regarding nebulization therapy in Kirkuk city hospitals . Kufa Journal for Nursing Sciences, 9(2).

Sharma, M. M., & Soni, S. A .(2024): Study to Assess the Knowledge Regarding Excess Oxygenation Hazards and their Preventive Measures among Nursing Officers at Spinph Hospital, Jaipur with a View to Develop an Information Booklet.

Teshale, M. M., Moges, N. A., Bitew, M. S., Birhanie, S. A., Gedfew, M., Negese, B., ... & Tsegaye, D. (2024): Oxygen therapy practice and associated factors among nurses working at an Ethiopian Referral Hospital. African Journal of Emergency Medicine, 14(3), PP:(186-192).

The Statistical Office of Beni-Suef University Hospital, (2023): Statistics of chest department, Statistical, Beni-Suef city, Eygept.

The Statistical Office of Beni-Suef University Hospital, (2024): Statistics of chest department, Statistical, Beni-Suef city, Egypt.

Yassin, A., & Mansour, K. (2021): Assessment of Nurse's Knowledge and Practice Regarding Oxygen Therapy at Teaching Hospitals in Al-Nasiriya City\Iraq. Kufa Journal for Nursing Sciences, 11(2), PP:(1-8).