

Nurses' Knowledge Regarding Management of Chronic Obstructive Pulmonary Disease at Khulna Medical College Hospital, Khulna

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ABSTRACT

Chronic Obstructive Pulmonary Disease (COPD) is a major global public health concern and currently ranks among the leading causes of morbidity and mortality worldwide. The prevalence of COPD has increased substantially over recent decades, particularly in low- and middle-income countries, creating a significant burden on healthcare systems. Nurses play a critical role in the effective management of COPD patients, and adequate knowledge among nursing professionals is essential to ensure quality patient care and improved clinical outcomes. Therefore, this study aimed to assess nurses' knowledge regarding the management of Chronic Obstructive Pulmonary Disease at Khulna Medical College Hospital, Khulna, Bangladesh. A hospital-based descriptive cross-sectional study was conducted among 152 registered nurses selected using a non-probability convenience sampling technique from a total study population of 250 nurses at Khulna Medical College Hospital. The study was carried out over a period of one year from January 2025 to December 2025. Data were collected using a self-administered structured questionnaire, and analyzed using descriptive statistical methods including frequency, percentage, and mean. The findings revealed that 51 (33.6%) respondents had good knowledge, 43 (28.3%) had very good knowledge, 37 (24.3%) demonstrated average knowledge, 17 (11.2%) had excellent knowledge, and only 4 (2.6%) had below-average knowledge regarding COPD management. The study also found that only 35.5% of nurses had received specialized training related to COPD management, while the majority had no formal training in this area. Nurses who had received specialized training demonstrated comparatively better knowledge regarding COPD management. The study concludes that although most nurses possessed an overall satisfactory level of knowledge regarding COPD management, important gaps remain in specialized respiratory care knowledge and evidence-based clinical practice. Regular specialized training programs, continuing professional education, workshops, seminars, and access to updated clinical guidelines are strongly recommended to improve nurses' competency in COPD management. Strengthening nurses' knowledge and clinical skills will ultimately contribute to improved patient care quality, better disease management, and improved health outcomes among patients with COPD.

1. Introduction

Chronic Obstructive Pulmonary Disease (COPD) is a progressive, preventable, and treatable chronic respiratory disease characterized by persistent airflow limitation, chronic airway inflammation, and symptoms such as dyspnea, chronic cough, sputum production, and wheezing. The disease develops primarily due to prolonged exposure to harmful particles and gases, particularly tobacco smoke, environmental pollutants, occupational dust, and biomass fuel exposure. COPD significantly reduces lung function and quality of life and is frequently associated with recurrent exacerbations requiring hospitalization and long-term management (GOLD, 2024).

COPD remains one of the leading causes of morbidity and mortality worldwide and represents a major public health challenge, particularly in low- and middle-income countries. According to the World Health Organization (WHO), approximately 3.5 million deaths were attributed to COPD globally in 2021, accounting for nearly 5% of all global deaths. The disease currently ranks among the top four causes of death worldwide, and its burden continues to rise because of population aging, tobacco consumption, urban air pollution, and occupational exposure (WHO, 2024).

The global burden of COPD has increased substantially over the past decade. The Global Burden of Disease Study reported that more than 390 million individuals worldwide are currently

living with COPD, with the majority of cases occurring in low- and middle-income countries where access to early diagnosis and treatment remains limited (GBD Collaborators, 2023). Projections suggest that COPD will become the third leading cause of death globally within the next decade if current trends continue (Momtazmanesh et al., 2023).

South Asian countries face a disproportionately high burden of COPD due to widespread smoking, indoor biomass fuel use, poor air quality, overcrowding, and limited access to preventive healthcare services. In countries such as Bangladesh, India, and Nepal, chronic respiratory diseases contribute substantially to premature mortality and disability. A recent regional analysis estimated that COPD prevalence among adults in South Asia ranges between 8% and 14%, with increasing incidence among older adults and populations exposed to household air pollution (Soriano et al., 2023).

In Bangladesh, COPD has emerged as a growing public health concern. Recent epidemiological studies reported that the prevalence of COPD among Bangladeshi adults aged 40 years and above ranges between 11% and 14%, with higher rates observed among rural populations, males, smokers, undernourished individuals, and populations exposed to biomass cooking fuels. Limited awareness, delayed diagnosis, inadequate healthcare infrastructure, and insufficient respiratory care services continue to contribute to poor disease outcomes in Bangladesh (Hossain et al., 2023).

Effective management of COPD requires comprehensive multidisciplinary care involving physicians, nurses, respiratory therapists, and healthcare administrators. Nurses play a particularly important role in COPD management because they provide continuous bedside monitoring, medication administration, oxygen therapy management, patient education, breathing exercise training, smoking cessation counseling, infection prevention measures, and early identification of disease exacerbations. Nurses are often the primary healthcare providers responsible for maintaining continuity of care and ensuring adherence to treatment protocols, especially among hospitalized patients (Zarei et al., 2022).

The quality of nursing care delivered to COPD patients is strongly influenced by nurses' level of knowledge regarding disease pathophysiology,

pharmacological management, oxygen therapy, inhaler techniques, pulmonary rehabilitation, emergency interventions, and prevention of complications. Insufficient knowledge among nursing professionals can lead to inappropriate clinical decision-making, delayed recognition of exacerbations, poor patient education, increased hospital readmission rates, and compromised patient safety (Alahmadi et al., 2026).

Several international studies have reported knowledge gaps among nurses regarding evidence-based COPD management. A study conducted in tertiary healthcare settings found that although nurses were routinely involved in respiratory care management, many demonstrated inadequate knowledge regarding inhaler administration techniques, pulmonary rehabilitation strategies, and management of acute exacerbations, indicating the need for continuous professional training and specialized respiratory nursing education (Rahman et al., 2023).

In tertiary care hospitals such as Khulna Medical College Hospital, nurses frequently manage patients suffering from chronic respiratory diseases including COPD. However, evidence regarding the level of nurses' knowledge concerning COPD management within the Bangladeshi healthcare system remains limited. Understanding existing knowledge gaps among nurses is essential for designing effective educational interventions, improving clinical competency, strengthening respiratory care services, and enhancing patient outcomes.

Therefore, the present study was conducted to assess nurses' knowledge regarding the management of Chronic Obstructive Pulmonary Disease at Khulna Medical College Hospital, Khulna, Bangladesh. The findings of this study will provide valuable information for nursing administrators, hospital management authorities, and healthcare policymakers to develop targeted training programs aimed at improving nurses' knowledge and competencies in COPD management, ultimately improving the quality of patient care and clinical outcomes.

2. Materials and Methods

2.1. Study design and setting

A descriptive cross-sectional study was conducted to assess nurse's knowledge regarding management of Chronic Obstructive Pulmonary Disease at Khulna Medical College Hospital, Khulna, Bangladesh. Khulna Medical College Hospital is a 500-bed tertiary-level teaching **hospital** that provides specialized healthcare services, including diagnosis, treatment, and management of patients with chronic respiratory diseases such as COPD. The study was designed to evaluate the level of knowledge among nurses involved in patient care within the hospital setting. The study was conducted for the one (01) year duration from January, 2025 to December -2025.

2.2. Study population and Sampling technique

The target population consisted of all registered nurses working at Khulna Medical College Hospital, Khulna. At the time of the study, the total number of registered nurses employed in the hospital was **480**, which constituted the study population.

A non-probability purposive sampling technique was used to select the study participants. Nurses who were actively working in different clinical departments during the data collection period and were willing to participate were included in the study.

2.3. Sample size determination and selection criteria

The sample size was initially calculated using the Cochran formula for sample size estimation:

Where, n = desired sample size

z = Standard normal deviate (it is set at 1.96 when confidence interval is 95%)

p = Prevalence of nutritional status which taken 50%

Here, p = 0.5 (unknown)

q = 1 – p = 1 – 0.5 = 0.5

d = degree of precision –usually set at 5% (0.05 acceptable error)

$$n = \frac{z^2 pq}{d^2}$$

$$= \left[\frac{(1.96)^2 \times (0.5) \times (0.5)}{(0.05)^2} \right]$$

$$= \frac{3.84 \times 0.25}{0.0025}$$

$$\frac{0.96}{0.0025}$$

$$= 384 \text{ sample}$$

$$n = 384$$

Sample size = $\frac{Nn}{N+n}$ 250]

$$\frac{480 \times 384}{480 + 384} \quad [\text{Population, } N=480]$$

$$\frac{184320}{864}$$

$$= 213.33$$

Due to time limitations, availability of respondents, and participant willingness, the final sample size for the study was 152 nurses.

Inclusion Criteria

- Registered nurses currently employed at Khulna Medical College Hospital
- Nurses directly involved in patient care services
- Nurses willing to participate voluntarily in the study

Exclusion Criteria

- Nurses on leave during the study period
- Nurses unwilling to participate in the study

2.4. Data collection instrument and procedure

A pre-tested, modified, self-administered structured questionnaire was used as the primary instrument for data collection. The questionnaire was developed based on relevant literature and study objectives and consisted of sections covering socio-demographic characteristics and knowledge regarding COPD management.

Data were collected through face-to-face interaction with participants using the structured questionnaire. Prior to data collection, respondents were informed about the objectives and purpose of the study, and adequate instructions were provided regarding questionnaire completion.

2.5. Pre-testing of questionnaire

The questionnaire was pre-tested among 15 senior staff nurses at Khulna Specialized Hospital, Khulna, who were not included in the final study sample. Pre-testing was conducted to evaluate the clarity, feasibility, acceptability, and comprehensibility of the questionnaire. Necessary modifications were made based on feedback obtained during the pilot testing process.

2.6. Validity and reliability

The validity of the research instrument was assessed through expert review by a panel of five specialists from the nursing and academic fields to ensure content validity and appropriateness of the questionnaire items. Reliability of the instrument was assessed during the pre-testing phase to evaluate consistency and suitability of the questionnaire for final data collection.

2.7. Data processing, analysis and interpretation

At the end of data collection, data were edited, checked and rechecked to see whether it is filled completely and consistently. Data analysis was done by using Statistical Packages for Social Sciences (SPSS) version 26. Descriptive statistical methods including frequency distribution, percentage, mean, and standard deviation were used for data analysis. The findings were interpreted and compared with findings from previously published relevant studies.

2.8. Knowledge scoring and grading criteria

To assess nurses' knowledge regarding COPD management, a total of 15 multiple-choice questions were included in the questionnaire. Each question contained four response options, of which only one option was correct.

Each correct answer was assigned one mark, while incorrect responses received zero marks. The maximum obtainable score was 15 points, and scores were converted into percentage values. Based on total scores, respondents were categorized according to the following grading criteria:

Knowledge Level	Score	Percentage
Excellent Knowledge	14–15	90–100%
Very Good Knowledge	12–13	80–89%
Good Knowledge	11	70–79%
Average Knowledge	9–10	60–69%
Below Average Knowledge	6–8	≤60%

2.9. Ethical considerations

Ethical approval for the study was obtained from the Institutional Review Board (IRB) of Khulna Nursing College, Khulna, following approval by the institutional protocol review committee.

Prior to data collection, formal written permission was obtained from the Director of Khulna Medical College Hospital. Participants were informed about the objectives, procedures, benefits, and voluntary nature of the study. Written informed consent was obtained from each participant before inclusion in the study.

Confidentiality and privacy of all collected information were maintained throughout the study. Participants were assured that their responses would be used solely for research purposes, and anonymity was preserved during data analysis and reporting.

3. Results

The results of the study were analyzed according to the nature of the study variables and presented using frequency, percentage, mean, and inferential statistical analysis. The findings are presented under two major sections: Part A: Socio-demographic characteristics of respondents and Part B: Knowledge regarding management of COPD.

3.1 Socio-demographic characteristics of the respondents

A total of 152 registered nurses participated in the study. The age distribution of respondents showed that the highest proportion, 47 (30.9%), belonged to the 36–40 years age group, followed by 39 (25.7%) in the 41–45 years group, 37 (24.3%) in the 30–35 years group, and 29 (19.1%) were aged 46 years and above. The mean age of the respondents was 40.80 years.

Regarding marital status, the majority of respondents, 138 (90.8%), were married, while 14 (9.2%) were unmarried. In relation to specialized training on COPD management, 98 (64.5%) respondents reported having no prior training, whereas only 54 (35.5%) respondents had received training related to COPD management (**Table 1**).

Table 1: Socio-demographic characteristics of respondents (n = 152)

Variables	Category	Frequency	Percentage
Age	30-35	37	24.30%
	35-40	47	30.90%

	41-45	39	25.70%
	46 years	29	19.10%
Marital status	Mean age-40.80		
	Unmarried	14	9.20%
Training related to COPD	Yes	54	35.50%
	No	98	64.50%

The distribution of respondents according to religion demonstrated that the majority were Muslim (59.9%), followed by Hindu (31.6%), Christian (7.9%), and Buddhist (0.7%) (Figure 1).

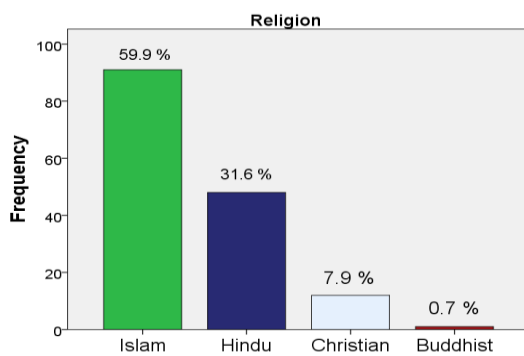


Figure 1: Distribution of the respondents by religion. (n=152)

Regarding professional qualifications, 55.9% of respondents held a Diploma in Nursing Science and Midwifery, 30.9% had completed Post Basic B.Sc. in Nursing, 9.9% held a Bachelor of Science in Nursing degree, and 3.3% possessed MPH or M.Sc. in Nursing qualifications (Figure 2).

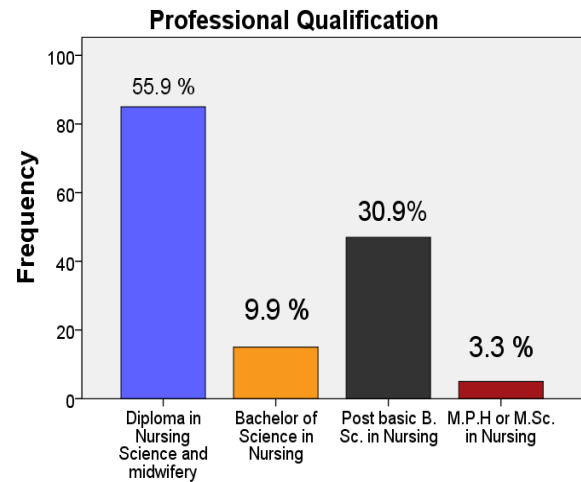


Figure 2. Distribution of the respondents by professional qualification. (n=152)

The distribution of respondents according to length of government service revealed that 43.4% had 6–10 years of service experience, 31.6% had 11–20 years, 14.5% had more than 20 years of service, and only 10.5% had 1–5 years of service experience (Figure 3).

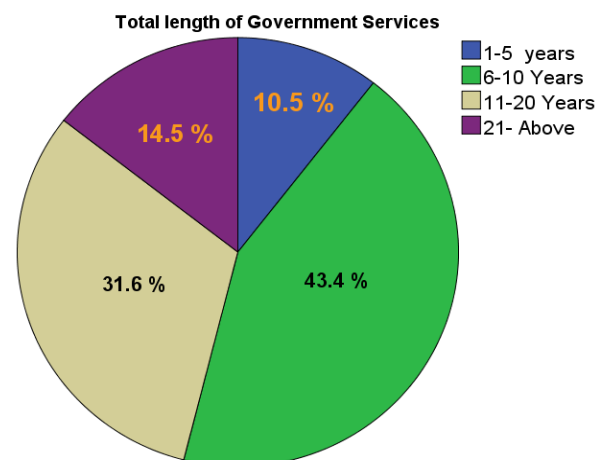


Figure 3: Distribution of the respondents by total length of government services. (n=152)

3.2 Knowledge regarding management of COPD

Assessment of respondents' knowledge regarding COPD management showed varying levels of understanding across different clinical domains. Regarding the definition of COPD, the majority of respondents (79, 52.0%) correctly identified COPD as a progressive disease characterized by persistent

respiratory symptoms and airflow limitation, while 42.8% identified it as a chronic inflammatory lung disease. Only 3.9% and 1.3% selected incorrect responses (Table 2).

Concerning risk factors for COPD, the majority (132, 86.8%) correctly identified long-term exposure to air pollutants and chemicals as a major risk factor. Regarding the cardinal clinical manifestations of COPD, 100 respondents (65.8%) correctly identified shortness of breath and phlegm production as the primary symptoms.

For immediate diagnostic procedures of COPD, 131 respondents (86.2%) correctly identified peak expiratory flow (PEF), spirometry, and chest X-ray as appropriate diagnostic investigations, whereas only 2.6% selected thoracocentesis incorrectly.

Regarding patient positioning during respiratory distress, 111 respondents (73.0%) correctly selected High Fowler's position to improve lung expansion, while 16.4% indicated encouraging rest and relaxation (Table 2).

Table 2. Knowledge-related responses regarding COPD management

Variables	Category	n	%
COPD	A chronic	65	42.80%
Means	inflammatory lung diseases		
	Persistent respiratory symptoms and airflow limitation	79	52.00%
	Intermittent breathing difficulty	6	3.90%
	Temporary bronchial inflammation	2	1.30%
Risk factors of COPD	Long term exposure to air pollutants and chemicals	132	86.80%
	Radiation exposure	9	5.90%
	Ozone depletion	7	4.60%
	High humidity	4	2.60%

Cardinal Sign of COPD	Shortness of Breath and Phlegm	100	65.80%
	Coughing that keeps at night	32	21.10%
	Chest expansion	18	11.80%
	Fever	2	1.30%
Immediate diagnostic procedures for COPD	Peak expiratory flow(PEF), spirometry and chest xray	131	86.20%
	Blood C/S	9	5.90%
	x-ray Abdomen	8	5.30%
	Thoracocentesis	4	2.60%
Comfortable position for COPD	High-fowler's position to improve lung expansion	111	73.00%
	Encourage the patient to rest and relax	25	16.40%
	Limited fluid intake to prevent edema	12	7.90%
	Administer a diuretic as prescribed	4	2.60%
First line treatment for stable COPD	Oxygen therapy and short acting bronchodilators	141	92.80%
	High dose diuretics	11	7.20%
	Long acting bronchodilators, corticosteroid	110	72.40%
	Antibiotics	37	24.30%
Non pharmacological interventions for COPD patients	Injections	3	2.00%
	Antihistamines	2	1.30%
	Encouraging deep breathing exercise	111	73.00%
	Implementing strict bed rest	17	11.20%
	Limiting all physical	17	11.20%

	activity		
	Restricting fluid intake	7	4.60%
Important nursing interventions for acute exacerbation of COPD	Administered corticosteroids prescribed	86	56.60%
	Encourage the patient to lie flat to improve breathing	51	33.60%
	Limiting fluid intake to prevent fluid overload	10	6.60%
	With holding bronchodilator treatment.	5	3.30%
Vaccine therapy in COPD exacerbation	Influenza and Pneumococcal vaccine	141	92.80%
	Typhoid vaccine	5	3.30%
	Hepatitis B vaccine	3	2.00%
	Measles Vaccine	3	2.00%
Prevention of Second Hand smoke exposure	Avoiding place where people smoke	127	83.60%
	Installing an air purifier	9	5.90%
	Taking vitamin supplements	10	5.90%
	Reducing salt intake	7	4.60%
Measures minimize air pollution for preventing COPD	Be sure to wear a special mask to protect yourself	129	84.90%
	Avoiding house plant	13	8.60%
	Using an air condition	5	3.30%
Cardiovascular complication	Hypertension	44	28.90%
	Pulmonary Hypertension	88	57.90%
	Aortic stenosis	10	6.60%
	Congenital heart diseases	10	6.60%
Complication can lead to COPD	Both chest infection and heart problem	118	77.60%

Chest infection	17	11.20%
Heart problem	15	9.90%
None of them	2	1.30%

Concerning emergency management, 141 respondents (92.8%) correctly identified oxygen therapy and short-acting bronchodilators as immediate treatment interventions. Similarly, 110 respondents (72.4%) correctly identified long-acting bronchodilators with corticosteroids as first-line treatment for stable COPD management.

For non-pharmacological management strategies, 111 respondents (73.0%) correctly identified deep breathing exercises as an important intervention for COPD patients, whereas smaller proportions selected bed rest, restriction of physical activity, or fluid restriction incorrectly.

When assessing knowledge regarding acute exacerbation management, 86 respondents (56.6%) correctly identified administration of prescribed corticosteroids as an important nursing intervention, while 33.6% incorrectly believed that lying flat improves breathing.

Regarding vaccination therapy, the majority of respondents (141, 92.8%) correctly identified influenza and pneumococcal vaccines as recommended preventive measures for COPD patients.

With respect to prevention of second-hand smoke exposure, 127 respondents (83.6%) correctly answered avoiding places where people smoke, while 129 respondents (84.9%) correctly identified wearing protective masks to reduce air pollution exposure as a preventive strategy.

In relation to complications of COPD, 88 respondents (57.9%) correctly identified pulmonary hypertension as a major cardiovascular complication. Furthermore, 118 respondents (77.6%) correctly recognized that COPD may lead to both chest infections and heart-related complications (Table 2).

3.3 Level of overall knowledge among respondents

Based on the knowledge scoring criteria, respondents demonstrated different levels of knowledge regarding COPD management. Among the total respondents, 51 (33.6%) had good knowledge, 43 (28.3%) demonstrated very good knowledge, 37 (24.3%) had average knowledge, 17 (11.2%) had excellent knowledge, and only 4 (2.6%) were categorized as having below average knowledge.

Overall findings indicate that although a considerable proportion of nurses possessed satisfactory knowledge regarding COPD management, significant gaps remain in specialized clinical understanding, particularly among nurses without formal training.

3.4 Association between professional qualification and level of knowledge

The association between respondents' professional qualification and overall knowledge level was assessed using the Pearson Chi-square test. Results demonstrated a statistically significant association between professional qualification and knowledge level regarding COPD management ($\chi^2 = 45.095$, $p < 0.001$).

Among respondents with Diploma in Nursing Science and Midwifery, the highest proportion (33 respondents, 21.7%) demonstrated good knowledge, whereas nurses with higher academic qualifications generally showed better overall knowledge performance (Table 3).

Table 3. Relationship between professional qualification and level of knowledge (n = 152)

Professional qualification	Knowledge level					Total	Test statistic
	Excellent (90-100)	Very good (80-89%)	Good (70-79%)	Average (60-69%)	Below average 60%		
Diploma in Nursing science and Midwifery	5(3.28%)	14(9.21%)	33 (21.71%)	30 (19.73%)	3 (1.97%)	85 (55.92%)	x=45.0 95a p=.000
Bachelor of Science in Nursing	1 (0.65%)	11 (7.23%)	3 (1.97%)	0	0	15 (9.86%)	
Post Basic BSc in Nursing	8 (5.26%)	16 (10.52%)	15 (9.86%)	7 (4.60%)	1 (0.65%)	47 (30.92%)	
MPH or MSc In Nursing	3 (1.97%)	2 (1.31%)	0	0	0	5 (3.28%)	
Total	17 (11.18%)	43 (42.31%)	51 (45.86%)	37 (24.34%)	4 (2.63%)	152 (100%)	

3.5. Association between special training and knowledge level

The study further examined the relationship between receiving special training on COPD management and overall knowledge level. Statistical analysis demonstrated a significant association between specialized training and knowledge level among respondents (Pearson Chi-square = 47.369, $p = 0.001$).

This finding indicates that nurses who had received formal training on COPD management

demonstrated significantly better knowledge compared to nurses without specialized training.

3.6 Association between knowledge and vaccination recommendation

The relationship between knowledge level and awareness regarding recommended vaccination for COPD prevention was also assessed. Statistical analysis showed no statistically significant association between knowledge level and awareness regarding vaccination recommendations (Pearson Chi-square = 21.327, $p = 0.046$).

This finding suggests that although respondents demonstrated relatively good knowledge regarding vaccination recommendations, this variable was not independently associated with the overall knowledge score.

The study findings indicate that nurses at Khulna Medical College Hospital possessed moderate to good knowledge regarding COPD management, with professional qualification and specialized training significantly influencing knowledge levels. The findings emphasize the importance of continuous professional education and targeted training programs to improve nurses' competency in COPD management.

4. Discussion

The present study assessed nurses' knowledge regarding the management of Chronic Obstructive Pulmonary Disease (COPD) among registered nurses working at Khulna Medical College Hospital, Bangladesh. The discussion interprets the findings in relation to previous national and international studies and highlights factors influencing nurses' knowledge regarding COPD management.

4.1 Socio-demographic Characteristics of the Respondents

In the present study, the mean age of the respondents was 40.80 years, indicating that most participants were relatively experienced nursing professionals working in tertiary healthcare settings. This finding is comparable with a study conducted in Nigeria, where the majority of nurses were within a similar middle-aged working population, reflecting the fact that experienced nurses are commonly involved in the management of chronic respiratory patients (Omotola et al., 2023). Age and clinical experience may positively influence professional competency and clinical decision-making in respiratory care practice.

Regarding marital status, the present study found that the majority of respondents (90.8%) were married, while only 9.2% were unmarried. This finding differs from a Nigerian study conducted by Omotola et al. (2023), where 38.5% of respondents were married, 26.9% were unmarried, 8.4% were widowed, and 7.2% were divorced. The observed variation may be explained by differences in demographic composition, cultural background,

and workforce structure across healthcare institutions in different countries.

With respect to professional qualification, the present study revealed that 55.9% of respondents held a Diploma in Nursing Science and Midwifery, 30.9% had completed Post Basic B.Sc. in Nursing, 9.9% possessed a Bachelor of Science in Nursing degree, and only 3.3% had MPH or M.Sc. in Nursing qualifications. Similar findings were reported in a study conducted in Nigeria where 29.1% of nurses held diploma qualifications, 38.0% possessed bachelor's degrees, 21.2% had master's degrees, and 11.7% held fellowship or PhD qualifications (Omotola et al., 2023). Although educational distribution varied, both studies indicate that professional qualification may influence clinical competency and knowledge acquisition among nursing professionals.

The current study demonstrated that 43.4% of respondents had 6–10 years of government service experience, followed by 31.6% with 11–20 years of service, 14.5% with more than 20 years of experience, and 10.5% with 1–5 years of service experience. A study conducted at the University of Baghdad, College of Nursing reported somewhat different findings, where 60% of nurses had 1–5 years of experience, while fewer participants had longer service duration (Saddon & Hassan, 2017). Differences may be attributable to institutional staffing structure and workforce distribution between healthcare systems.

The present study further found that 64.5% of respondents had not received any formal training related to COPD management, whereas only 35.5% had received specialized training. Similar findings were observed in a previous study where more than half of nurses reported lacking formal training opportunities related to respiratory disease management (Saddon & Hassan, 2017). This finding suggests that limited access to continuing professional development programs may contribute to gaps in specialized respiratory care knowledge among nurses.

4.2 Knowledge Regarding Management of COPD

The present study found that 86.8% of respondents correctly identified long-term exposure to air pollutants and harmful chemicals as major risk factors for COPD, while only a small proportion selected incorrect options such as radiation

exposure, ozone depletion, or humidity. This finding is consistent with current evidence-based recommendations provided by the Global Initiative for Chronic Obstructive Lung Disease (GOLD), which identifies tobacco smoke, environmental pollution, occupational exposure, and biomass fuel exposure as the major modifiable risk factors for COPD development (GOLD, 2024). Similar observations have been reported by Mahmood et al. (2023), who emphasized the importance of healthcare professionals' awareness regarding risk factor identification for effective disease prevention strategies.

Regarding diagnostic procedures, 86.2% of respondents correctly identified peak expiratory flow (PEF), spirometry, and chest X-ray as important diagnostic tools for COPD assessment. This indicates relatively good knowledge among respondents concerning early clinical diagnosis of COPD. In contrast, a previous study conducted by Godoy et al. (2019) reported that nearly 76% of healthcare professionals underestimated the importance of spirometry in COPD diagnosis, demonstrating comparatively lower diagnostic awareness than observed in the present study. Early diagnostic competency among nurses is particularly important because delayed recognition frequently contributes to disease progression and increased hospitalization rates.

In relation to overall knowledge level, the present study demonstrated that 33.6% of respondents had good knowledge, 28.3% had very good knowledge, 24.3% had average knowledge, 11.2% had excellent knowledge, and only 2.6% had below average knowledge regarding COPD management. The overall mean knowledge score was 76.66%, indicating an overall good level of knowledge among participants. Similar findings were reported in a study conducted in India, where 56% of nurses demonstrated average knowledge, 30% had good knowledge, and 14% had poor knowledge regarding COPD management (Prajapati & Singh, 2025). The relatively better knowledge observed in the present study may reflect differences in hospital setting, professional exposure, and clinical experience among participants.

The present study also examined the relationship between professional qualification and knowledge level regarding COPD management. Statistical analysis demonstrated a significant association between professional qualification and knowledge level (Pearson Chi-square = 45.095, $p < 0.001$).

Nurses with higher academic qualifications generally demonstrated better knowledge compared with diploma-level nurses. The highest proportion of respondents with good knowledge (21.7%) belonged to the Diploma in Nursing Science and Midwifery group, although nurses with bachelor's and postgraduate qualifications showed comparatively stronger overall performance.

This finding supports previous evidence suggesting that advanced nursing education improves critical thinking ability, clinical competency, and application of evidence-based practice in respiratory care management (Alahmadi et al., 2026). Higher academic preparation often exposes nurses to updated clinical guidelines, advanced disease management protocols, and continuing professional development opportunities, ultimately improving patient care quality.

Furthermore, the present study found that nurses who had received specialized training related to COPD management demonstrated significantly better knowledge compared with those without training. This finding highlights the importance of regular in-service education, workshops, and continuing professional development programs in strengthening nurses' competency in managing chronic respiratory diseases. Similar findings have been reported internationally, where structured respiratory nursing education programs significantly improved knowledge, confidence, and patient management skills among nursing professionals (Zarei et al., 2022).

The findings of the present study suggest that although nurses at Khulna Medical College Hospital demonstrated moderate to good knowledge regarding COPD management, gaps remain in specialized respiratory care knowledge, particularly among nurses without advanced education and formal training. Strengthening continuing education programs and introducing specialized COPD management training may significantly improve nursing competency and ultimately enhance patient outcomes in tertiary healthcare settings.

5. Conclusion

The present hospital-based descriptive cross-sectional study was conducted to assess nurses' knowledge regarding the management of Chronic

Obstructive Pulmonary Disease (COPD) among nurses working at Khulna Medical College Hospital, Khulna, Bangladesh. A total of 152 nurses participated in the study, and data were collected using a self-administered structured questionnaire. The collected data were analyzed using descriptive statistical methods including frequency, percentage, and mean.

The findings of the study revealed that the majority of respondents demonstrated a satisfactory level of knowledge regarding COPD management. Among the participants, 33.6% had good knowledge, 28.3% had very good knowledge, 24.3% had average knowledge, 11.2% had excellent knowledge, and only 2.6% had below average knowledge. These findings indicate that although most nurses possessed an acceptable level of knowledge regarding COPD management, important knowledge gaps still exist in certain aspects of evidence-based respiratory care.

The study further demonstrated that nurses who had received specialized training related to COPD management showed better overall knowledge compared with those who had not received formal training. Professional qualification and participation in training programs were identified as important factors influencing knowledge level among respondents.

Overall, the study highlights the importance of continuous professional development, specialized in-service training, and access to updated clinical guidelines to strengthen nurses' competency in COPD management. Improving nurses' knowledge and clinical skills will ultimately contribute to better quality patient care, early recognition of complications, improved disease management, reduced hospital-related complications, and improved health outcomes among COPD patients.

Recommendations

Based on the findings of the present study, the following recommendations are proposed:

1. Regular specialized training programs, workshops, and seminars should be organized to improve nurses' knowledge and competency regarding evidence-based management of COPD.
2. Continuing professional development (CPD) programs focusing on respiratory disease management should be incorporated into routine nursing education and hospital training systems.
3. Standardized clinical guidelines and management protocols for COPD should be made readily available and easily accessible in all healthcare settings to support evidence-based nursing practice.
4. Further multi-center studies with larger sample sizes should be conducted in different healthcare institutions in Bangladesh to better understand nurses' knowledge and competency regarding COPD management.
5. Hospital administrators and nursing supervisors should encourage skill-based practical training and periodic competency assessment to improve the quality of respiratory patient care.

Limitations of the study

Despite providing important findings, the present study had several limitations:

1. The study was conducted in only one tertiary care hospital, therefore the findings may not be generalizable to all healthcare institutions in Bangladesh.
2. The study assessed knowledge only and did not evaluate actual clinical practice or competency of nurses regarding COPD management. Therefore, the relationship between knowledge and practice could not be determined.
3. The use of non-probability purposive sampling may have introduced sampling bias, which may affect the representativeness of the findings.
4. The cross-sectional design of the study limited the ability to establish causal

relationships between training, professional qualification, and knowledge level.

5. Responses were based on self-administered questionnaires, which may introduce response bias due to over-reporting or socially desirable responses from participants.

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