

Knowledge and Practice of COPD Prevention and Early Detection Among Healthcare Workers in Tertiary Hospitals in India

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ABSTRACT

Background: Chronic Obstructive Pulmonary Disease (COPD) is a leading cause of morbidity and mortality worldwide. Early detection and preventive strategies are crucial, particularly in India where smoking, biomass fuel exposure, and air pollution are major risk factors. Healthcare workers (HCWs) play a pivotal role in prevention and early diagnosis.

Objective: To assess the knowledge and practice of COPD prevention and early detection among healthcare workers in tertiary hospitals in India.

Methods: A cross-sectional study was conducted among 300 participants: 100 MBBS students, 50 BDS students, 50 nursing students, and 100 paramedical workers (including nurses and technicians) from four tertiary hospitals. A

structured questionnaire assessed knowledge (risk factors, symptoms, diagnostic tools, prevention strategies) and practice (screening, patient education, smoking cessation counseling).

Results: MBBS students demonstrated the highest knowledge scores (mean 72%), followed by nursing students (65%), BDS students (58%), and paramedical workers (52%). However, practice scores were lower across all groups, with only 40% routinely engaging in patient education or screening. Spirometry awareness was high (70%) but actual use was limited (25%).

Conclusion: While knowledge of COPD among HCWs is moderate to good, translation into practice remains inadequate. Strengthening training programs, integrating COPD modules into curricula, and promoting hands-on screening practices are essential to improve early detection and prevention.

Keywords: COPD, health care workers, tertiary hospitals, India

1. INTRODUCTION

Chronic Obstructive Pulmonary Disease (COPD) is a progressive respiratory disorder characterized by airflow limitation that is not fully reversible. Globally, COPD is the third leading cause of death, with India contributing significantly to the burden due to high prevalence of smoking, indoor air pollution, and occupational exposures. Early detection and prevention are critical to reducing disease progression and improving patient outcomes.

Healthcare workers (HCWs) are frontline agents in COPD prevention and management. Their knowledge and practice directly influence patient education, risk factor modification, and timely diagnosis. However, gaps often exist between theoretical knowledge and practical application. This study aims to evaluate the knowledge and practice of COPD prevention and early detection among HCWs in tertiary hospitals in India.

2. SPECIFIC OBJECTIVES:

- **Assess Knowledge Levels**
 - To determine the **awareness of healthcare workers** regarding the causes, risk factors, and symptoms of COPD.
 - To evaluate their understanding of **preventive strategies** such as smoking cessation, pollution control, and occupational safety.
- **Evaluate Practices**
 - To examine the **current practices of healthcare workers** in screening, diagnosing, and managing COPD in tertiary hospitals.
 - To identify whether healthcare workers follow **national or international guidelines** for COPD prevention and early detection.
- **Identify Gaps Between Knowledge and Practice**
 - To analyze discrepancies between what healthcare workers know and what they actually implement in practice.
 - To highlight areas where **knowledge does not translate into effective patient care**.
- **Explore Barriers and Challenges**
 - To identify **institutional, resource-related, or personal barriers** that hinder effective COPD prevention and early detection.
 - To understand challenges such as **lack of training, limited diagnostic tools, or patient-related factors**.

- **Assess Training and Educational Needs**

- To evaluate the **need for continuing medical education (CME)** or training programs on COPD prevention and management.
- To recommend strategies for **capacity building** among healthcare workers.

- **Promote Policy and Program Development**

- To provide evidence for **hospital administrators and policymakers** to strengthen COPD-related interventions.
- To support the integration of **COPD screening and prevention programs**

3. METHODOLOGY

- **Study Design:** Cross-sectional descriptive study.

- **Setting:** Four tertiary-level hospitals in India (National Institute of Medical Sciences Jaipur 303121, Jaipur, Rajasthan, India; Government Institute of Medical Sciences, Gautam Buddha Nagar 201310, Uttar Pradesh, Fortis Hospital, Malviya Nagar, Jaipur 302017, Rajasthan, India; Dental College and Hospital, Bagru, Jaipur, Rajasthan, Rajasthan; College of Nursing, Bagru, Jaipur Rajasthan)

- **Participants:**

- 100 MBBS students
- 50 BDS students
- 50 nursing students
- 100 paramedical workers (including nurses and technicians)

- **Sample Size:** 300 participants.

- **Data Collection Tool:** Structured questionnaire with sections on:

- Knowledge: risk factors, symptoms, diagnostic methods, prevention strategies.
- Practice: patient education, smoking cessation counseling, use of spirometry, screening initiatives.

Likert Scale Questionnaire (15 Items)

Instructions: Rate each statement on a 5-point scale (1 = Strongly Disagree, 5 = Strongly Agree).

- I am aware of the major risk factors for COPD (smoking, biomass fuel, pollution).
- I can identify early symptoms of COPD (chronic cough, breathlessness).
- I am confident in counseling patients about smoking cessation.
- I know how to use spirometry for COPD diagnosis.
- I routinely educate patients about COPD prevention.
- Indoor air pollution is a significant risk factor for COPD.
- Occupational exposure contributes to COPD development.
- I feel adequately trained to detect COPD early.
- COPD prevention is emphasized in my curriculum/training.

- I believe patient education can reduce COPD burden.
- I have participated in COPD awareness programs.
- I am comfortable discussing COPD with patients.
- I believe early detection improves patient outcomes.
- I regularly advise patients on lifestyle modifications for COPD prevention.
- Institutional support for COPD prevention is adequate in my hospital.

Scoring: Knowledge and practice scores expressed as percentages.

- **Analysis:** Descriptive statistics, chi-square test for categorical variables, ANOVA for group comparisons.

4.RESULTS

Knowledge Scores

Group	Mean Knowledge Score (%)
MBBS students	72
Nursing students	65
BDS students	58
Paramedical workers	52

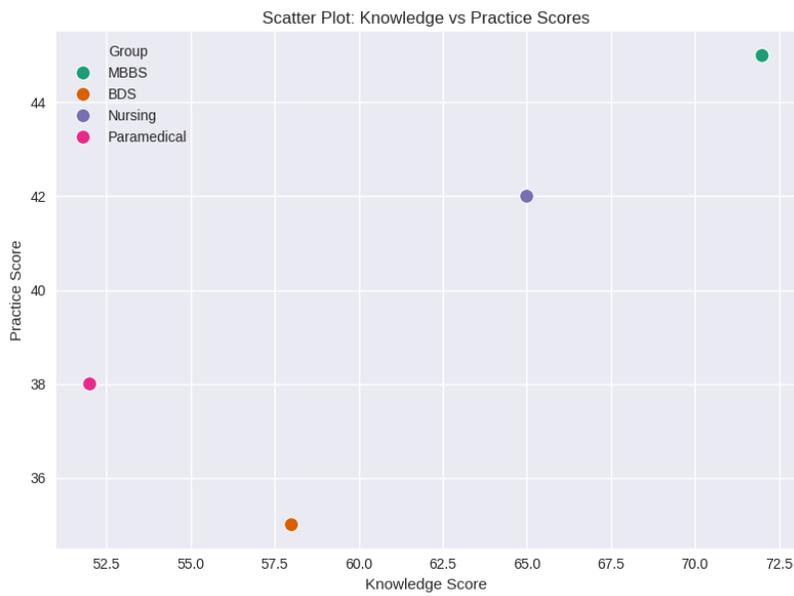
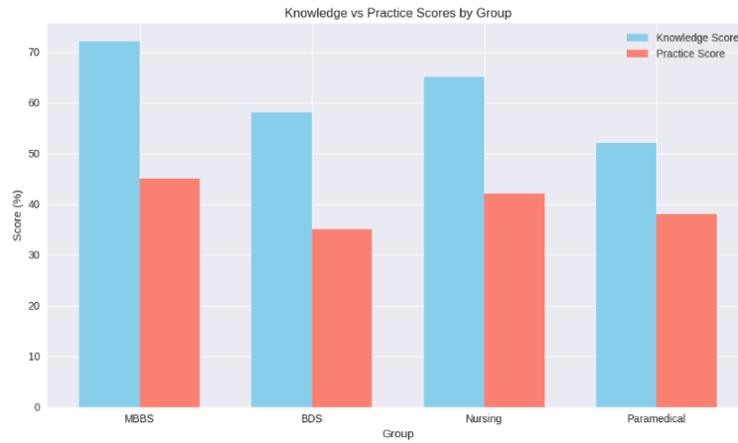
- MBBS students showed better understanding of COPD risk factors and diagnostic tools.
- Nursing students were more aware of preventive strategies such as smoking cessation and lifestyle modification.
- BDS students had moderate knowledge, primarily limited to oral manifestations and general awareness.
- Paramedical workers demonstrated the lowest knowledge, with gaps in understanding spirometry and early detection.

Practice Scores

- Only 40% of participants reported routinely engaging in patient education.
- Smoking cessation counseling was practiced by 35% of HCWs.
- Awareness of spirometry was high (70%), but actual use was limited to 25%.
- Preventive practices such as advising on indoor air pollution reduction were reported by 30% of participants.

Statistical Analysis

The following visualizations and tables summarize the knowledge and practice scores across groups:



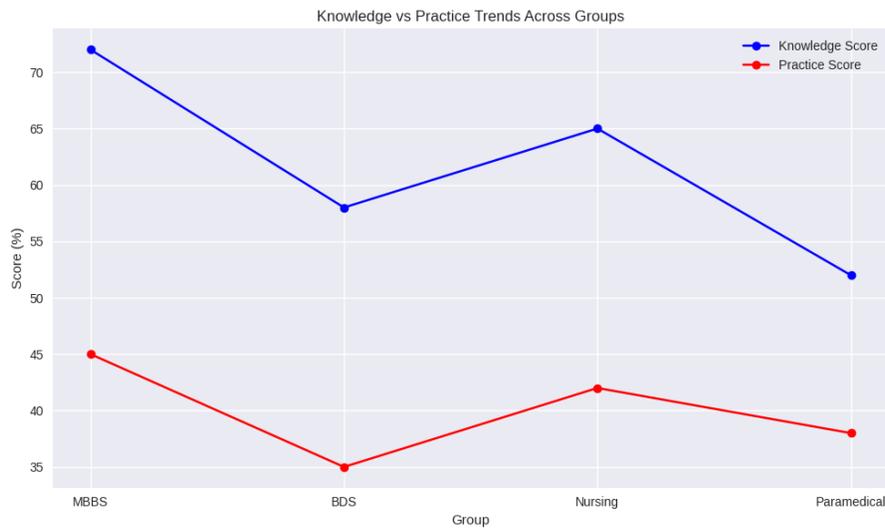


Table 1: Knowledge vs Practice Scores

Group	Knowledge Score (%)	Practice Score (%)
MBBS Students	72	45
BDS Students	58	35
Nursing Students	65	42
Paramedical Workers	52	38

Inclusion & Exclusion Criteria

Inclusion Criteria:

- MBBS, BDS, Nursing students, and paramedical workers (nurses, technicians) from selected tertiary hospitals.
- Participants willing to provide informed consent.
- Age group: 18–45 years.

Exclusion Criteria:

- HCWs with prior specialized training in pulmonology.
- Those unwilling to participate.
- Participants with chronic respiratory illness (to avoid bias).

5. DISCUSSION

This study highlights a significant gap between knowledge and practice among HCWs in tertiary hospitals. While MBBS students and nursing students demonstrated relatively higher knowledge, practical application was limited across all groups.

Barriers to practice include lack of training in spirometry, limited emphasis on COPD in curricula, and inadequate institutional support for preventive programs. Similar studies in India and other developing countries have reported comparable findings, emphasizing the need for structured training and awareness campaigns.

Integrating COPD modules into medical, dental, and nursing education, along with workshops for paramedical staff, could enhance both knowledge and practice. Additionally, institutional policies promoting routine screening and patient education would strengthen early detection efforts.

6. CONCLUSION

Knowledge of COPD prevention and early detection among HCWs in tertiary hospitals is moderate, but practice remains inadequate. Bridging this gap requires:

- Enhanced training programs.
- Curriculum integration of COPD modules.
- Hands-on workshops on spirometry and patient counseling.
- Institutional support for preventive initiatives.

Improving HCWs' knowledge and practice will ultimately contribute to reducing the burden of COPD in India.

7. LIMITATIONS

- Conducted in only four tertiary hospitals, limiting generalizability.
- Self-reported practices may not reflect actual clinical behavior.
- Cross-sectional design prevents causal inference.
- Limited use of spirometry due to resource constraints.

8. RECOMMENDATIONS

- Integrate COPD modules into medical, dental, and nursing curricula.
- Conduct regular workshops for paramedical staff on spirometry and counseling.
- Strengthen institutional support for preventive programs.
- Encourage inter-professional collaboration for COPD awareness campaigns.
- Expand study to multiple regions for broader applicability.

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