

Study of Aggravation of Symptoms in COPD Patient Due to Poor Air Quality

Sandeep Kumar

Master of Public Health (MPH)

Dr. Giri Lal Gupta Institute of Public health Affairs, University of Lucknow, Lucknow

Abstract—

Background: Chronic Obstructive Pulmonary Disease (COPD) is a major public health problem worldwide and is strongly associated with environmental and behavioral risk factors. Poor air quality has emerged as an important factor responsible for aggravation of COPD symptoms, especially among vulnerable populations.

Objectives: To Study aggravation of symptoms in COPD patient due to poor air quality among patients attending BCM Hospital and surrounding areas of Sitapur district.

Methodology: A quantitative observational cross-sectional study was conducted among 68 diagnosed COPD patients attending BCM Hospital and surrounding areas of Sitapur district. Data were collected using a structured questionnaire. Information regarding exposure to poor air quality, smoking status, environmental exposure, and respiratory symptoms was collected. Data were analyzed using frequency, percentage, tables, and graphical representation.

Results: The findings revealed that the majority of participants were exposed to moderate poor air quality levels (AQI 101–200). Out of 68 participants, 54 (79.4%) participants were exposed to moderate poor air quality levels, while 14 (20.6%) participants were exposed to mild poor air quality levels. Smoking, biomass fuel exposure, indoor irritants, and environmental pollution were major contributing factors associated with aggravation of COPD symptoms.

Conclusion: The study concluded that poor air quality significantly aggravates COPD symptoms among patients. Increasing AQI levels, smoking, and environmental exposure were important factors associated with worsening respiratory health.

Keywords—COPD, AQI, Air Pollution, Respiratory Health, Smoking, Environmental Exposure

I. INTRODUCTION

Chronic Obstructive Pulmonary Disease (COPD) is a common chronic respiratory disease characterized by persistent airflow limitation and respiratory

symptoms such as dyspnea, cough, sputum production, and wheezing. COPD is one of the leading causes of morbidity and mortality worldwide and contributes significantly to healthcare burden and reduced quality of life.

Poor air quality has become an important environmental health concern affecting respiratory health globally. Exposure to particulate matter (PM_{2.5} and PM₁₀), smoke, dust, and toxic gases may aggravate respiratory diseases including COPD. In India, increasing industrialization, vehicular pollution, biomass fuel use, and environmental degradation contribute significantly to poor air quality.

Several studies have reported that increased Air Quality Index (AQI) levels are associated with worsening respiratory symptoms, increased hospital visits, and decline in lung function among COPD patients. Rural populations are particularly vulnerable due to indoor pollution, biomass smoke exposure, and poor ventilation.

The present study was conducted to study of aggravation of symptoms in COPD patients due to poor air quality among patients attending BCM Hospital and surrounding areas of Sitapur district.

II. OBJECTIVES

Primary Objective

To Study of aggravation of symptoms in COPD patients due to poor air quality.

Secondary Objectives

1. To identify environmental risk factors associated with COPD symptoms aggravation.
2. To assess AQI exposure among COPD patients.
3. To evaluate the role of smoking and environmental pollution.

III. METHODOLOGY

Study Design
Quantitative observational cross-sectional study.

Sampling Technique
Convenient sampling technique.

Study Area
BCM Hospital and surrounding areas of Sitapur district, Uttar Pradesh.

Data Collection Tool
Structured questionnaire and interview method.

Study Population
Diagnosed COPD patients.

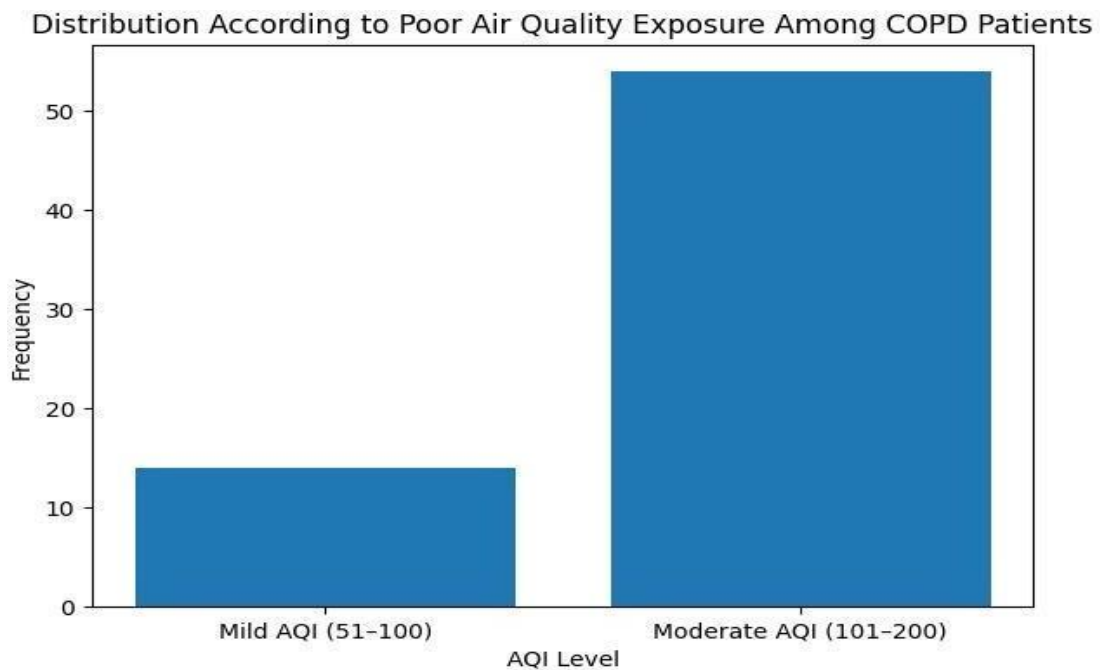
Data Analysis
Data were analyzed using frequency and percentage distribution. Findings were presented through tables and graphs.

Sample Size
68 participants.

IV. RESULTS

Table: Distribution According to Poor Air Quality Exposure among COPD Patients

AQI Level	Frequency	Percentage
Mild Poor Air Quality (51–100)	14	20.6%
Moderate Poor Air Quality (101–200)	54	79.4%
Total	68	100%



(Bar chart 1: Distribution according to poor air quality)

Interpretation

The majority of participants were exposed to moderate poor air quality levels, indicating that poor environmental air quality may contribute significantly to aggravation of COPD symptoms.

exposure and aggravation of COPD symptoms. Most participants were exposed to moderate AQI levels and reported worsening respiratory symptoms.

V. DISCUSSION

The findings of the present study demonstrated a significant association between poor air quality

The study findings were consistent with previous studies that reported increased respiratory morbidity associated with environmental pollution and particulate matter exposure. Smoking, biomass fuel use, and indoor irritants further contributed to

worsening respiratory health among study participants.

VI. CONCLUSION

The study concluded that poor air quality plays an important role in aggravation of COPD symptoms among patients. Moderate AQI exposure, smoking, and environmental pollutants were major contributing factors associated with worsening respiratory conditions.

The findings emphasize the need for environmental awareness, pollution control measures, smoking cessation programs, and preventive healthcare interventions to reduce respiratory morbidity among vulnerable populations.

VII. RECOMMENDATIONS

1. Promote awareness regarding harmful effects of air pollution.
2. Encourage smoking cessation among high-risk individuals.
3. Improve air quality monitoring systems.
4. Promote use of clean cooking fuels.
5. Conduct regular respiratory health screening programs.
6. Strengthen environmental health policies and preventive healthcare services.

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