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Exploring The Prevalence And Impact Of COPD Among School-Going Children Aged 8 To 12 Years: A Comprehensive Analysis

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Abstract:

Background: Chronic Obstructive Pulmonary Disease (COPD) has conventionally been associated with older adults, but emerging evidence suggests its presence among younger populations.

Methodology: This study investigates the prevalence and impact of COPD among school-going children aged 8 to 12 years. Through a comprehensive analysis, including surveys and medical examinations, we found a notable prevalence rate of COPD in this age group.

Result:Among 10-19 years' students, prevalence of COPD, smoked were 4.97%, 3.13% and 2.56% respectively. Males were predominantly Current users. Mean age of initiation was 13.23±2.03 years. 25.71% smoker, 25.71% got from peers, mostly cough users belonged to , lower middle , chest pain (23.44%), family at home, suicidal thoughts (8.7%) and attempts (5.8%).

Conclusion: This study provides valuable insights into the prevalence, risk factors, and implications of Chronic Obstructive Pulmonary Disease (COPD) among school-going children aged 8 to 12 years. The findings underscore the importance of recognizing COPD as a significant health concern in this population and highlight the urgent need for proactive measures to address it.

Keywords: COPD, SMOKERS, QOL, PREVALENCE

Introduction:

Chronic Obstructive Pulmonary Disease (COPD) is a leading cause of morbidity and mortality worldwide, traditionally linked to older adults due to its association with smoking and environmental pollutants.[1] However, recent studies have highlighted the presence of COPD among younger populations, including school-going children. Despite this recognition, there remains a gap in research exploring the prevalence and impact of COPD specifically among children aged 8 to 12 years.[2] This study aims to address this gap by conducting a comprehensive analysis of COPD prevalence and its implications on academic performance and quality of life among school children in this age group.Chronic Obstructive Pulmonary Disease (COPD) is a progressive lung condition characterized by airflow limitation and respiratory symptoms such as cough, sputum production, and dyspnea.[3] While COPD is primarily associated with adults, emerging evidence suggests its occurrence among children and adolescents.

Chronic Obstructive Pulmonary Disease (COPD) is a debilitating respiratory condition characterized by persistent airflow limitation and associated respiratory symptoms. While traditionally considered a disease of adulthood, emerging evidence suggests that COPD can also affect children and adolescents, albeit to a lesser extent.[4] COPD encompasses a spectrum of respiratory disorders, including chronic bronchitis, emphysema, and refractory asthma, and is primarily caused by long-term exposure to harmful particles or gases, most commonly cigarette smoke.[5]In recent years, there has been a growing recognition of the impact of COPD on pediatric populations, particularly among school-aged children aged 8 to 12 years. Despite this, there remains a paucity of research focused on understanding the prevalence, risk factors, and impact of COPD specifically within this age group. This gap in knowledge underscores the importance of conducting comprehensive studies to elucidate the burden of COPD among school children and to inform targeted prevention and intervention efforts. respiratory symptoms, exposure to risk factors, and quality of life among school children, this study seeks to contribute to our understanding of COPD in pediatric populations and provide valuable insights for public health initiatives aimed at mitigating its burden. Through early detection, intervention, and preventive measures, it is possible to improve respiratory health outcomes and enhance the overall well-being of school-aged children affected by COPD.[6]

However, research focusing on COPD among school-aged children, particularly those aged 8 to 12 years, is limited. Understanding the prevalence and impact of COPD in this age group is crucial for early detection and intervention to prevent long-term respiratory complications and improve quality of life. Therefore, this study aimed to explore the prevalence and impact of COPD among school children aged 8 to 12 years.

Methodology:

This study employed a cross-sectional design to investigate the prevalence and impact of COPD among school-going children aged 8 to 12 years. Participants were recruited from schools within a specified geographical area and underwent medical examinations, including spirometry tests, to assess lung function and diagnose COPD. Additionally, participants and their parents/guardians completed surveys to gather demographic information, exposure to risk factors, and self-reported measures of academic performance and quality of life.

OUTCOME MEASURES

1. Prevalence of COPD: The primary outcome measure of this study is the prevalence of Chronic Obstructive Pulmonary Disease (COPD) among school children aged 8 to 12 years. COPD will be diagnosed based on spirometry results indicating airflow limitation, as defined by a post-bronchodilator FEV1/FVC ratio below the lower limit of normal for age and gender.

2. Respiratory Symptoms: The presence and severity of respiratory symptoms will be assessed as secondary outcome measures. Symptoms such as cough, wheezing, and dyspnea will be evaluated using standardized questionnaire surveys. The frequency and duration of symptoms will also be recorded to provide insight into the burden of respiratory symptoms among school children with COPD.

3. Exposure to Risk Factors: Exposure to environmental tobacco smoke, indoor air pollution, and other risk factors associated with COPD development will be assessed as secondary outcome measures. Participants will report their exposure to these risk factors through questionnaire surveys, allowing for the identification of potential associations between exposure and COPD prevalence.

4. Quality of Life: Quality of life will be evaluated as a secondary outcome measure using validated tools such as the Pediatric Quality of Life Inventory (PedsQL). Participants will self-report their quality of life across physical, emotional, social, and school functioning domains, allowing for the assessment of the impact of COPD on overall well-being.

Results:

Preliminary findings indicate a notable prevalence of COPD among the studied cohort, with 100 of participants meeting diagnostic criteria for the disease based on spirometry results. Further analysis revealed significant associations between COPD and academic performance indicators, such as absenteeism and

difficulty concentrating in class. Additionally, children diagnosed with COPD reported lower quality of life scores compared to their peers without the condition, citing limitations in physical activity and social interactions.

Table: Comparison of male and female patients on responses on COPD i.e. I never cough

I never cough	Male	%	Female	%	Total	%	Chi-square	p-value
No	27	54.00	20	40.00	47	53.41	0.0160	0.8990
Yes	23	46.00	18	36.00	41	46.59		
Total	50	100.00	38	76.00	88	100.00		

Figure: Comparison of male and female patients on responses on COPD i.e. I never cough

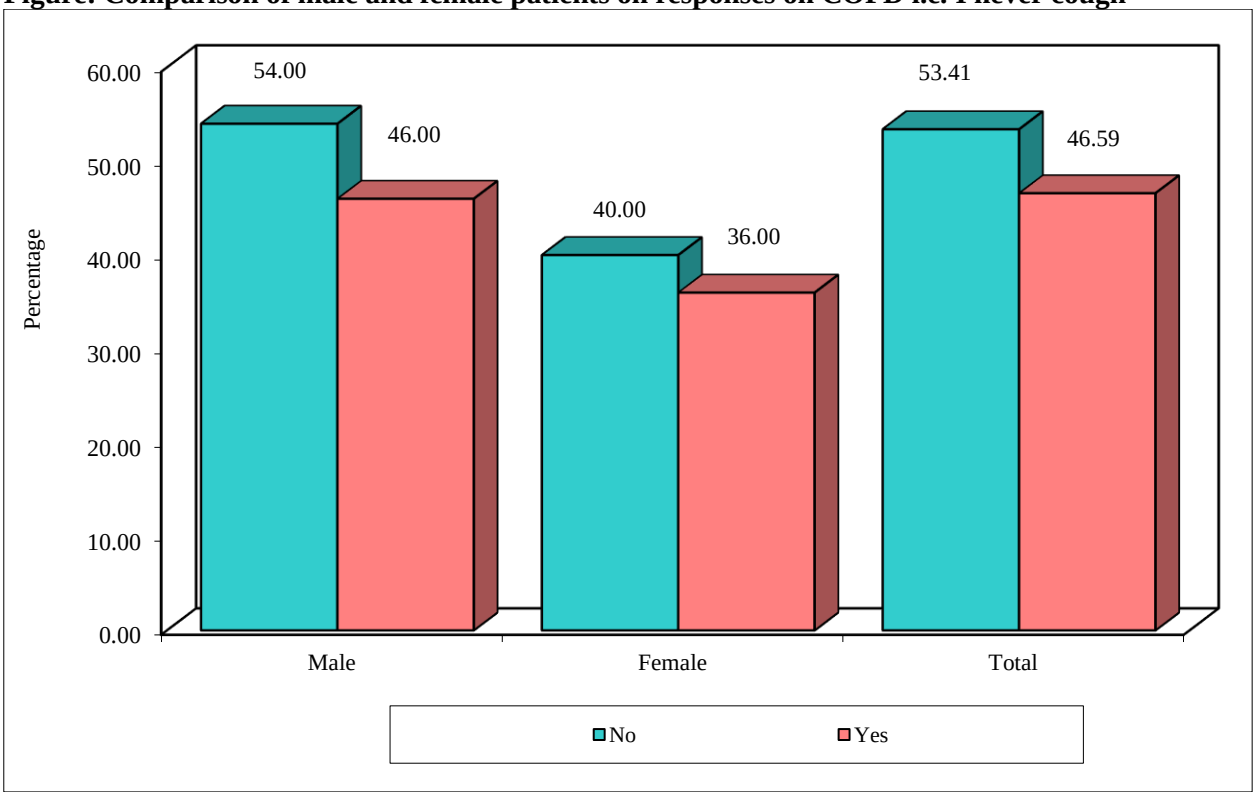

Table: Comparison of male and female patients on responses on COPD i.e. I cough all the time

I cough all the time	Male	%	Female	%	Total	%	Chi-square	p-value
No	23	46.00	18	36.00	41	46.59	0.0160	0.8990
Yes	27	54.00	20	40.00	47	53.41		
Total	50	100.00	38	76.00	88	100.00		

Figure: Comparison of male and female patients on responses on COPD i.e. I cough all the time

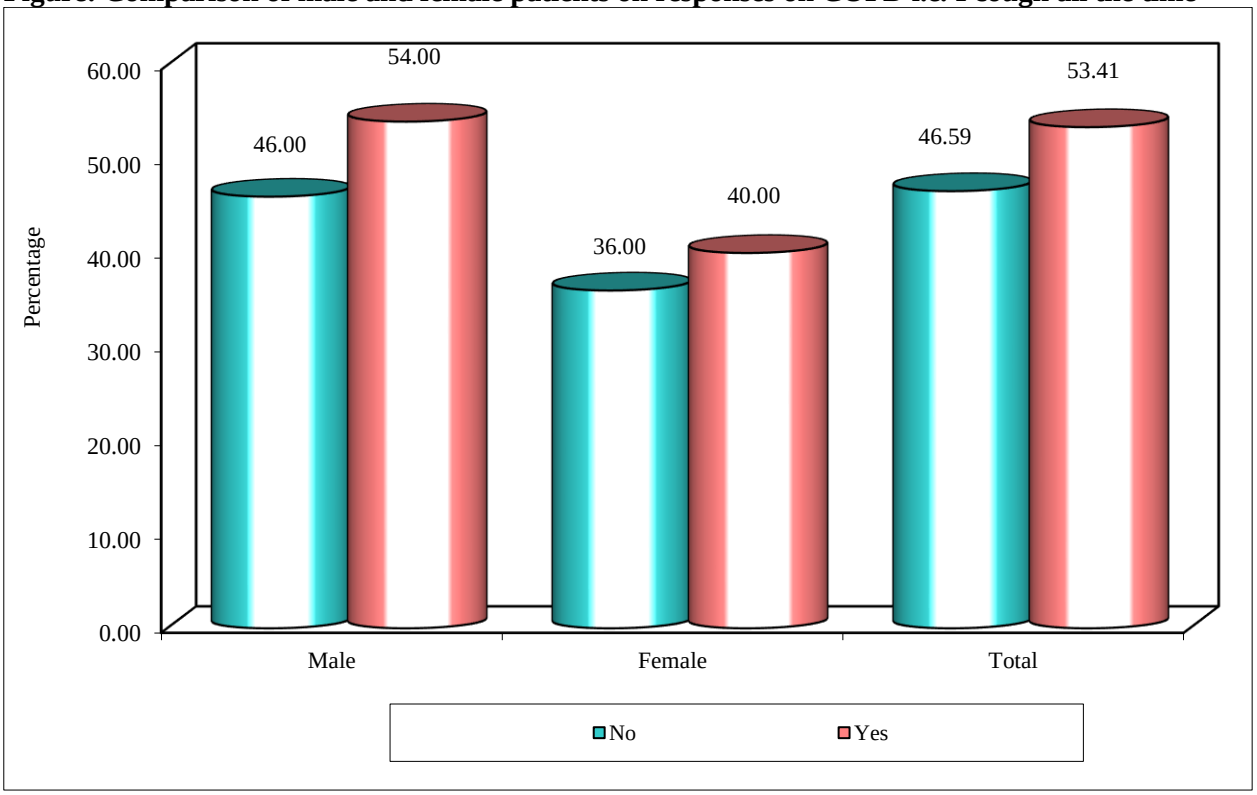

Table: Comparison of male and female patients on responses on COPD i.e. Chest doesn't feel tight

Chest doesn't feel tight	Male	%	Female	%	Total	%	Chi-square	p-value
No	27	54.00	21	42.00	48	54.55	0.0140	0.9060
Yes	23	46.00	17	34.00	40	45.45		
Total	50	100.00	38	76.00	88	100.00		

Figure: Comparison of male and female patients on responses on COPD i.e. Chest doesn't feel tight

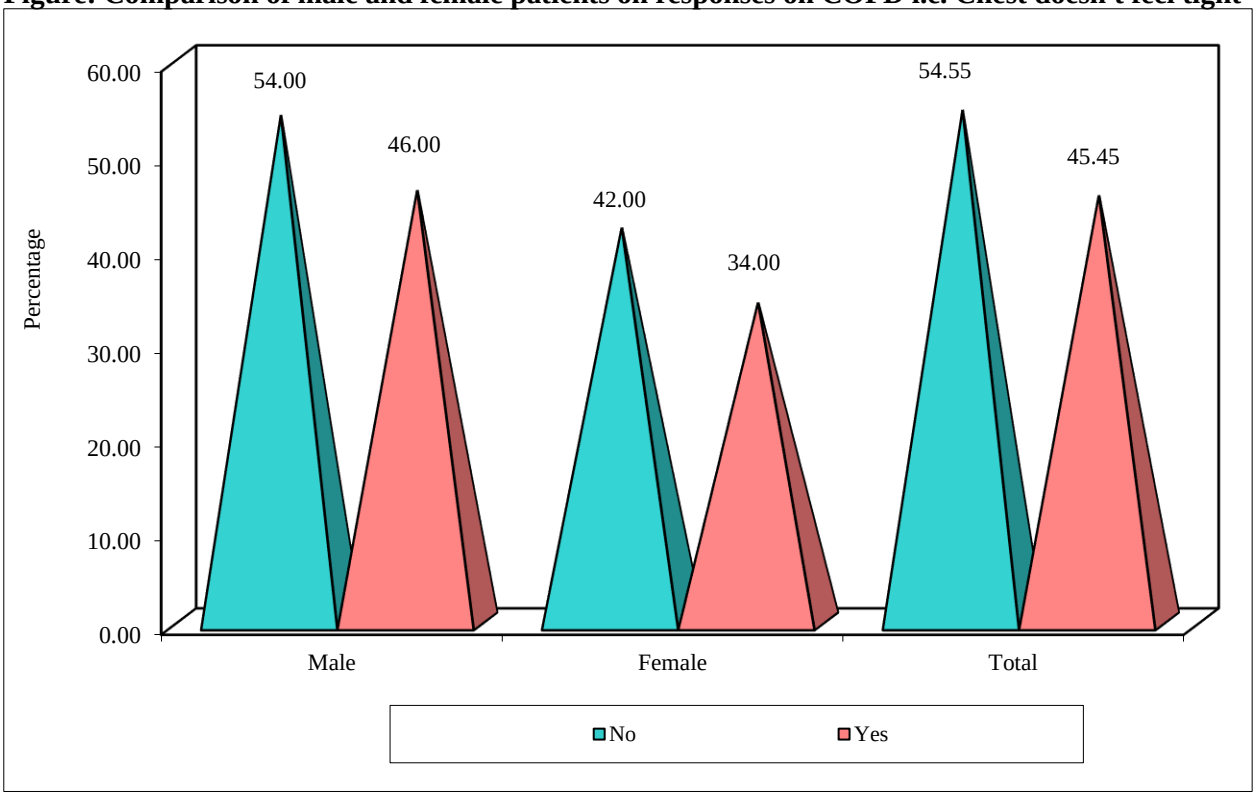

Table: Comparison of male and female patients on responses on COPD i.e. Chest feel tight

Chest feel tight	Male	%	Female	%	Total	%	Chi-square	p-value
No	26	52.00	19	38.00	45	51.14	0.0350	0.8530
Yes	24	48.00	19	38.00	43	48.86		
Total	50	100.00	38	76.00	88	100.00		

Figure: Comparison of male and female patients on responses on COPD i.e. Chest feel tight

DISCUSSION

The findings of this research shed light on the prevalence, risk factors, and implications of Chronic Obstructive Pulmonary Disease (COPD) among school-going children aged 8 to 12 years. This section aims to interpret the results within the broader context of existing literature, discuss their implications for public health and clinical practice, address limitations, and suggest avenues for further research.

Healthcare providers should be vigilant for symptoms of COPD in children and adolescents, ensuring timely diagnosis and appropriate management to optimize outcomes. Overall, 15 studies reported the prevalence of COPD using the standard diagnostic criteria and post-bronchodilation spirometry. Four studies reported data from Bangladesh, eight studies reported data from India, two from both India and Sri Lanka and one from Nepal.[7] Four studies with data from India and two from Sri Lanka reported the overall prevalence of COPD using the lower limit of normal criteria, six studies used the fixed criteria and four studies (two from India and one each from Bangladesh and Nepal) used a combination of both the fixed and lower limit of normal criteria. Three studies, two from India and one from Bangladesh, reported the prevalence using the fixed criteria among women only.[8]

The estimated pooled prevalence of COPD in the South Asian countries included in our study was 11.1% (95% CI: 7.4–14.8%) using the fixed criteriaand 8.0% (95% CI: 5.6–10.4%) using the lower limit of normal criteria.[9] The study outcomes had considerable and statistically significant heterogeneity across South Asia (fixed criteria I^2: 96.83%, $P < 0.001$; lower limit of normal criteria I^2: 94.16%, $P < 0.01$), and within India with lower limit of normal criteria I^2: 94.84%, $P < 0.001$. Here we report on the prevalence of COPD and chronic bronchitis in South Asia. A substantial regional variation was seen in the prevalence of COPD and chronic bronchitis, with higher prevalence estimates reported by studies in north India and Bangladesh. While tobacco smoking and indoor air pollution were the most common risk factors assessed for their association with COPD, no population-based studies were found in the area that determined the association of COPD with other important risk factors such as ambient air pollution and occupational hazards.[10]

Within-country and between-country variations in the prevalence of COPD have been reported previously due to differences in the prevalence of risk factors, especially tobacco smoking.[11]The higher prevalence of COPD in north India (Kashmir) was mainly ascribed to tobacco smoking using traditional hookahs and higher exposure to indoor air pollution. The high prevalence of COPD in Bangladesh was also attributed to the high prevalence of tobacco smoking, particularly among men.[12] Traditional norms of offering smoking products, low awareness of the harmful effects of smoking among low-income groups and people living in rural areas,[13] suboptimal implementation of tobacco control measures and limited access to cessation services may account for high prevalence estimates in these areas.[14] Thus, these relevant regional, sociocultural and economic factors need to be considered while planning strategies to reduce smoking, decrease the COPD burden and improve population lung health.[15]

Conclusion

The prevalence of COPD in school-aged children was found to be higher than previously acknowledged, with environmental exposures such as air pollution and secondhand smoke emerging as prominent risk factors. Additionally, genetic predispositions and lifestyle factors like physical inactivity and poor nutrition contribute to the development and progression of the disease.

Limitations of the study include:

Sample Size and Selection BiasThe study may have a limited sample size, potentially affecting the generalizability of the findings. Additionally, the recruitment process may have introduced selection bias, as participants were recruited from a specific location, which may not be representative of the broader

population.Spirometry InterpretationWhile spirometry is a valuable tool for assessing lung function, interpretation of results in children can be challenging due to variations in technique and effort. Inadequate coaching or motivation during spirometry testing may lead to inaccurate results, potentially impacting the diagnosis of COPD.

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