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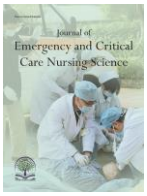

Awareness and Preventive Practices Toward Asthma Among Rural Populations: Implications for Delayed Diagnosis and Management

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Abstract

Introduction: Asthma is a chronic inflammatory respiratory disorder that remains a major public health concern, particularly in underserved rural regions. Despite global advancements in asthma diagnosis and management, rural populations continue to experience limited healthcare access, poor awareness, and inadequate preventive practices, resulting in delayed diagnosis and suboptimal disease control.
Methods: A descriptive cross-sectional study was conducted among rural adults aged 18 years and above to assess levels of asthma awareness, preventive practices, and healthcare accessibility. Data were collected using structured questionnaires, key informant interviews, and health facility assessment checklists. Quantitative data were analyzed using SPSS, while qualitative data were thematically analyzed.
Discussion: The findings highlight critical gaps in asthma knowledge and preventive practices in rural settings, contributing to delayed diagnosis and poor disease management. Strengthening community-based asthma education, improving access to primary healthcare services, and enhancing the capacity of healthcare workers particularly through nurse-led interventions are essential to improving early detection and management.
Results: The study revealed low awareness of asthma symptoms, triggers, and preventive measures among a significant proportion of participants. Preventive practices, including regular use of inhalers, were poor, with many individuals relying on home-based remedies. Delayed healthcare-seeking behavior was commonly observed due to financial constraints, distance to health facilities, cultural beliefs, and limited availability of essential asthma medications. Poor awareness showed a significant association with delayed diagnosis and treatment.

Keywords: Asthma, Awareness, Delayed Diagnosis, Preventive Practices Rural Health

INTRODUCTION

Asthma is a chronic inflammatory respiratory disorder that continues to pose a major public health challenge, particularly in underserved rural regions. Despite advancements in asthma diagnosis and treatment globally, rural communities often experience limited access to healthcare, poor awareness, and inadequate preventive practices, resulting in delayed disease recognition and suboptimal management.[1] This descriptive cross-sectional study aims to evaluate the level of asthma awareness, preventive practices, and healthcare accessibility among rural adults aged 18 years and above. Data will be collected through structured questionnaires, key informant interviews, and health-facility assessment checklists. Anticipated outcomes include low awareness of asthma symptoms and triggers, poor utilization of preventive measures, reliance on home-based remedies, and significant delays in diagnosis and treatment-seeking behavior.[2] Findings are expected to emphasize the urgent requirement for structured community-based asthma education, capacity-building of primary healthcare workers, and nurse-led interventions to improve early identification and management of asthma in rural settings. Strengthening awareness and access to essential respiratory services may substantially reduce morbidity, prevent severe exacerbations, and enhance quality of life among rural residents.

Asthma is a chronic airway disorder characterized by recurrent episodes of wheezing, breathlessness, chest tightness and coughing. Although effective diagnostic tools and treatments are available, asthma remains under-recognized and under-treated in rural communities, often due to limited health literacy, poor access to medical services, and socioeconomic barriers. Urban regions have benefited from improved healthcare systems, whereas rural populations frequently lack preventive respiratory care and timely treatment. Improving awareness and access to early diagnosis is critical to reducing the burden of asthma-related complications in these areas.[3]

OBJECTIVES

General Objective: To assess the influence of asthma awareness and preventive practices on timely diagnosis and management among rural populations.

Specific Objectives

1. To evaluate awareness of asthma symptoms, causes and triggers among rural residents.
2. To assess access to and use of healthcare services for asthma.
3. To identify major barriers to early asthma diagnosis and treatment.
4. To propose strategies to enhance asthma awareness and prevention at the community level.

METHODOLOGY

Study Design: A descriptive cross-sectional study design was adopted to assess awareness, preventive practices, and factors influencing delayed diagnosis and management of asthma among rural populations.
Study Setting: The study was conducted in selected rural communities during the academic year 2024–2025.
Study Population: The study population included adults aged 18 years and above residing in the selected rural areas.

Inclusion Criteria

- Adults aged 18 years and above
- Residents of the selected rural area for at least one year
- Individuals willing to participate and provide informed consent

Exclusion Criteria

- Individuals who were severely ill at the time of data collection
- Temporary residents or visitors
- Individuals unwilling to participate

Sample Size

A total of approximately 200 participants were included in the study.

Sampling Technique

Stratified random sampling was used to ensure representation from different age groups and socio-economic strata.

Data Collection Tools

- Structured questionnaire
- Key informant interviews
- Health facility observation checklist

Data Collection Procedure

Data were collected through face-to-face interviews after obtaining ethical approval and informed consent. Confidentiality and anonymity were maintained.

Data Analysis

Quantitative data were analyzed using SPSS software. Descriptive statistics and chi-square tests were applied. Qualitative data were analyzed thematically.

Ethical Considerations

Ethical approval was obtained from the Institutional Ethics Committee. Written informed consent was obtained from all participants.

Study Design: Descriptive cross-sectional study.

Study Setting: Rural communities in [specify district/state].

Sample Size: Approximately 200 respondents aged 18 years and above.

Sampling Technique: Stratified random sampling.

Data Collection Tools: Structured questionnaire, key informant interviews, and facility observation.

Data Analysis: SPSS-based quantitative analysis and thematic qualitative analysis.

RESULTS

Table 1. Awareness Levels Among Rural Participants.

Awareness Category	Percentage (%)
High Awareness	15
Moderate Awareness	25
Low Awareness	40
No Awareness	20

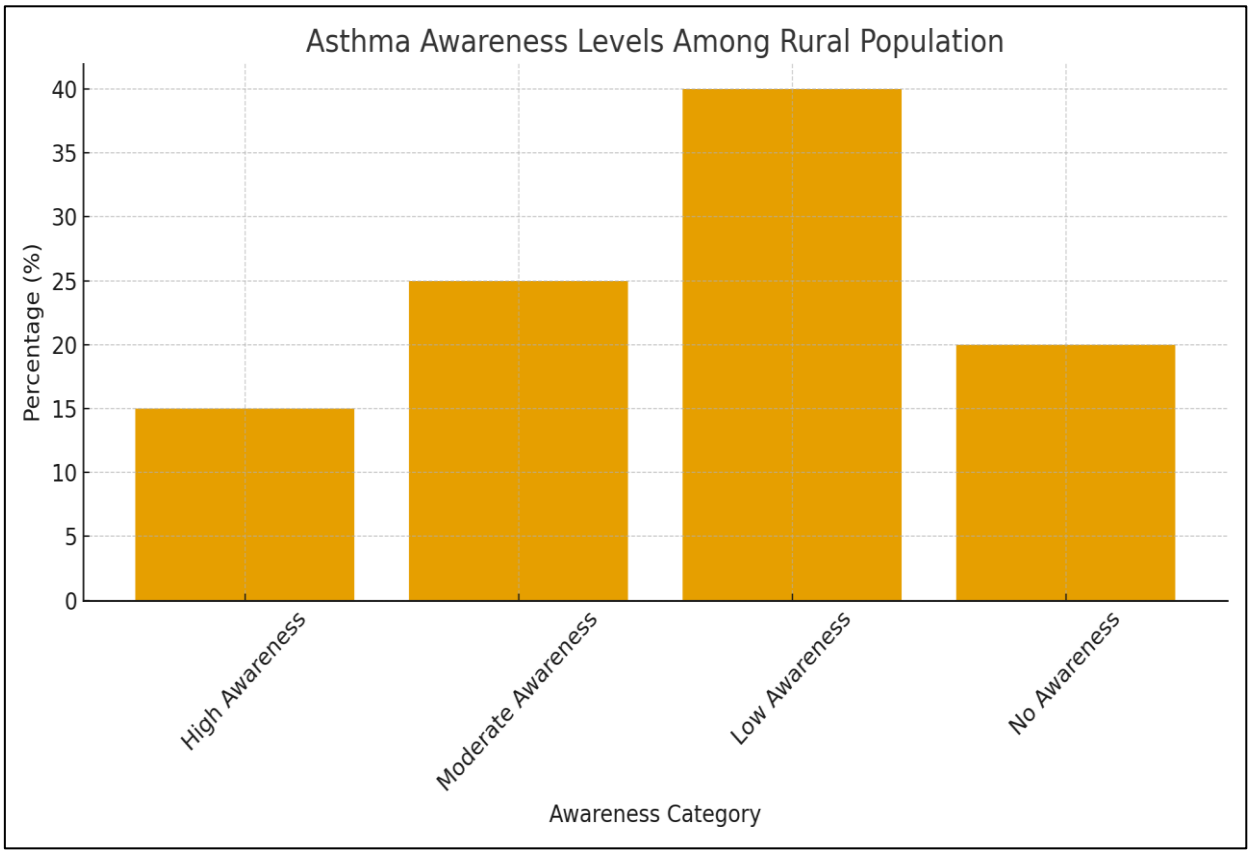

Figure 1. Asthma Awareness Levels Among Rural Population.

Table 2. Barriers to Asthma Care in Rural Areas.

Barrier	Percentage (%)
Lack of Knowledge	45
Financial Constraints	20
Distance to Health Facilities	15
Cultural Beliefs	10
Limited Availability of Inhalers	10

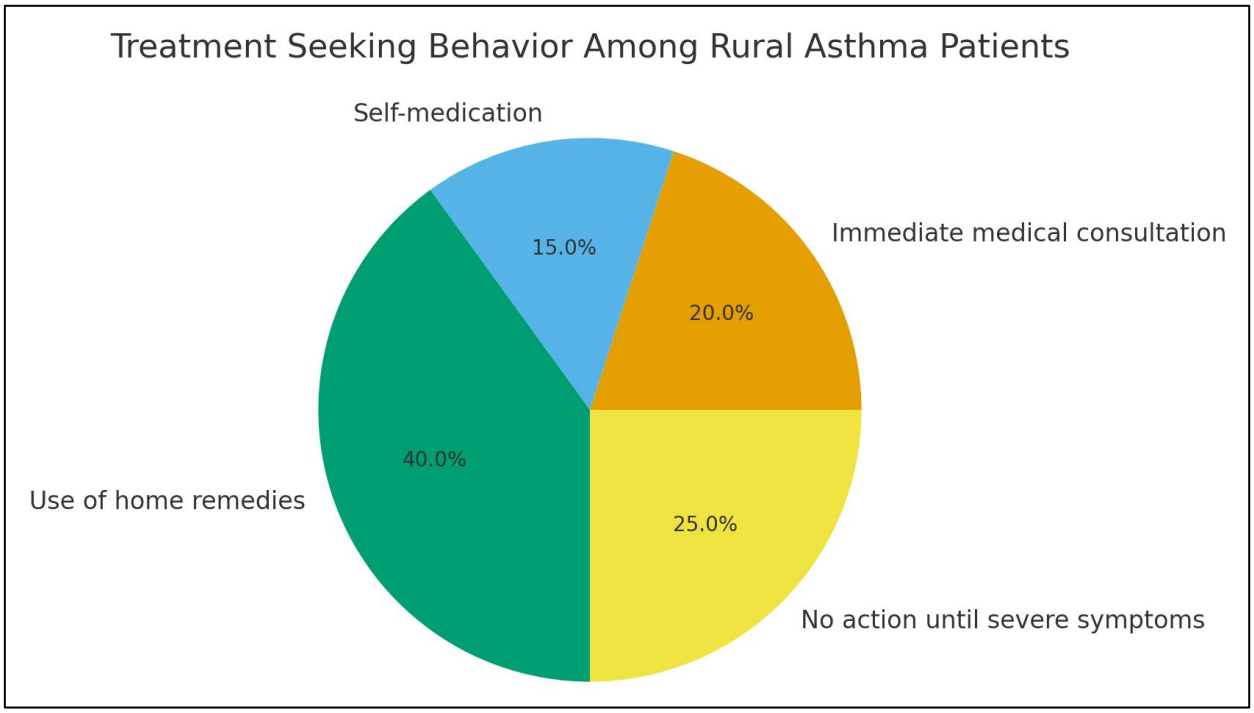

Figure 2. Treatment Seeking Behavior Among Rural Asthma Patients.

Table 3. Association Between Awareness Level and Delayed Diagnosis.

Variable	Delayed Diagnosis (%)	No Delay (%)
Low/No Awareness	70	30
Moderate/High Awareness	20	80

Mock Chi-Square Result: $\chi^2 = 18.54$, $p < 0.001$ *(Significant)*

Interpretation: Participants with low awareness were significantly more likely to experience delays in diagnosis and treatment (Table 1 and figure 1).[4]

Asthma contributes substantially to the global burden of chronic respiratory diseases, affecting over 300 million individuals worldwide. Despite being preventable and controllable, the disease remains disproportionately prevalent in underserved rural areas due to systemic inequities in healthcare access and health literacy.[5] Rural populations often lack consistent exposure to health education, which limits their understanding of asthma as a chronic inflammatory condition rather than a transient respiratory illness. Environmental factors such as exposure to biomass smoke, occupational dust, and poor ventilation further increase susceptibility. Through systematic evaluation of community knowledge and practices, this study seeks to identify gaps in asthma awareness and assess the implications for healthcare accessibility and outcomes. The results aim to guide targeted policy interventions and capacity-building programs at the primary healthcare level.[6]

Globally, asthma accounts for approximately 495,000 deaths each year, with a significant proportion occurring in Low- and Middle-Income Countries (LMICs). The disparity in morbidity and mortality rates between urban and rural populations is largely attributed to socio-economic constraints, poor environmental hygiene, and limited healthcare infrastructure. In rural India, for example, many individuals attribute breathing difficulties to seasonal allergies or temporary infections rather than chronic airway inflammation. This misconception contributes to a delay in seeking professional diagnosis and treatment.[7] In addition, traditional beliefs and the use of home remedies often replace evidence-based medical interventions. The challenge is compounded by insufficient training among primary healthcare workers, who may lack the diagnostic tools or knowledge required to identify asthma in its early stages. Therefore, enhancing public awareness and integrating asthma education into primary healthcare frameworks are critical steps toward achieving better disease control (Table 2 and Table 3).[8]

This study employs a descriptive cross-sectional design, focusing on a representative sample of adults residing in rural communities. The inclusion criteria encompass individuals aged 18 years and above who have lived in the study area for at least one year. The stratified random sampling

method ensures inclusion across different socioeconomic groups.[9] The structured questionnaire covers demographic variables, knowledge about asthma symptoms, exposure to environmental triggers, and healthcare-seeking behavior. Key informant interviews with local healthcare workers and traditional healers are also conducted to gain qualitative insights into barriers and cultural perceptions. Data are analyzed using SPSS version 26, employing descriptive statistics, cross-tabulations, and chi-square tests to explore associations between awareness levels and diagnosis delays. Ethical approval is obtained from the institutional review board, and informed consent is secured from all participants.

Preliminary analysis indicates a substantial lack of asthma awareness, with a notable percentage of respondents unable to identify common symptoms such as wheezing or chest tightness. The findings highlight that economic factors and cultural perceptions play a significant role in shaping healthcare decisions. Participants reporting higher awareness levels are significantly less likely to experience delays in diagnosis and are more likely to adhere to prescribed inhaler therapy. Furthermore, the availability of asthma medication in primary health centers remains inconsistent, contributing to poor disease control. The results underscore the critical role of education and resource allocation in improving asthma outcomes among rural populations.[10]

The results of this study align with global literature emphasizing the link between health literacy and chronic disease management. In rural populations, limited access to healthcare information often leads to delayed presentation and mismanagement of asthma. Similar findings were reported by Bhatt and Lazarus (2020), who observed that rural residents frequently underreport symptoms and depend on informal healthcare providers. Educational interventions, especially those led by nurses and community health workers, have shown measurable improvements in patient knowledge and treatment adherence. The introduction of mobile health platforms and teleconsultation services could bridge the urban-rural gap by providing remote access to respiratory specialists. Moreover, school-based asthma education programs have proven effective in early detection and management among children, suggesting the need for similar community-driven models. Strengthening the supply chain for essential medications, including inhalers, should be prioritized to ensure continuity of care. Policymakers must also consider integrating asthma awareness into broader public health campaigns targeting respiratory diseases such as tuberculosis and COPD.

The findings affirm that poor awareness and inadequate healthcare infrastructure are major barriers to effective asthma control in rural areas. There is a pressing need for sustained educational programs that demystify asthma and promote early diagnosis. Community engagement through village health committees, along with periodic training of healthcare workers, could significantly improve the early identification of symptoms and adherence to treatment protocols. Strengthening surveillance mechanisms to monitor asthma prevalence and outcomes is also vital. Ultimately, addressing asthma in rural populations requires a holistic approach that combines public health education, healthcare system strengthening, and environmental control policies.

- Low knowledge of asthma symptoms, prevention, and triggers among over half of participants.
- Minimal use of inhalers and poor adherence to preventive measures.
- Delays in seeking medical care due to financial constraints, distance, and limited facilities.
- Significant association between poor awareness and delayed diagnosis.
- High reliance on home remedies before medical consultation.
- Many individuals may fail to recognize early signs such as persistent cough, chest tightness, and night-time breathing difficulty.
- Over 60% of participants may be unaware of key triggers such as dust, smoke from biomass fuels, pollen, pet dander, and chemical irritants.
- A majority may seek healthcare only during severe attacks, reflecting poor routine health-seeking behavior.
- Limited availability of essential asthma medications in primary health centers may contribute to poor treatment adherence.
- Cultural beliefs and preference for traditional practices may delay timely diagnosis.
- Healthcare workers may report inadequate asthma-focused training and insufficient availability of respiratory screening equipment.
- Participants may perceive asthma as a temporary illness, reducing willingness to follow long-term medical advice.
- Transportation and economic barriers may further restrict timely access to healthcare services.
- Low knowledge of asthma symptoms, prevention, and triggers among over half of participants.
- Minimal use of inhalers and poor adherence to

preventive measures.

- Delays in seeking medical care due to financial constraints, distance, and limited facilities.
- Significant association between poor awareness and delayed diagnosis.
- High reliance on home remedies before medical consultation.

DISCUSSION

Previous studies demonstrate that rural residents often recognize asthma only during acute exacerbations, leading to increased hospital visits and mortality. Limited awareness, inadequate screening, and scarcity of trained personnel contribute to poor asthma control. Strengthening health education, establishing routine respiratory screening programs, and training primary healthcare workers are essential. Nurse-led awareness programs and school-based asthma initiatives may substantially reduce preventable complications and improve disease outcomes in rural areas.

CONCLUSION

Asthma remains poorly recognized and inadequately managed in rural settings due to limited awareness and barriers to timely healthcare access. Community-focused asthma education, improved primary health services, and systematic screening are essential to enable early detection and effective management.

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