

Patient Knowledge and Awareness Regarding Asthma: Insights from a Tertiary Care Centre

Unni R Baby^{1*}, Vishnu Narayanan S², Sruthi Raghunath³, Supriya Adiody⁴

¹⁻⁴Department of Respiratory Medicine, Jubilee Mission Medical College and Research Institute, Thrissur, Kerala, India

DOI:

10.55489/njmr.160220261239

***Corresponding author:**

Unni R Baby
Email: unnirbaby@gmail.com

Date of Submission: 03/11/2025

Date of Acceptance: 26/01/2026

Date of Publication: 01/04/2026

Funding Support:

None Declare

Conflict of Interest:

The authors have declared that no conflict of interest exists.

How to cite this article:

Baby UR, Narayanan SV, Raghunath S, Adiody S. Patient Knowledge and Awareness Regarding Asthma: Insights from a Tertiary Care Centre. Natl J Med Res 2026;16(02):77-81. DOI: 10.55489/njmr.160220261239

ABSTRACT

Background: Asthma prevalence and morbidity require effective patient education for optimal management; however, knowledge gaps persist across populations. This study assessed asthma knowledge in Indian adults, examined the demographic determinants, and identified critical knowledge deficits.

Methods: A cross-sectional survey of 100 adults was conducted using a standardized asthma knowledge questionnaire. Demographic variables and detailed knowledge assessments were analyzed using chi-square, t-tests, ANOVA, and multivariate logistic regression.

Results: Key findings included high awareness of allergy and air pollution as triggers (>90% correct), poor understanding of inhaler types (24% correct), and objective disease monitoring. Educational level emerged as the only significant independent predictor of high asthma knowledge (OR = 1.55, 95% CI: 1.06-2.29, p = 0.025). Age was negatively correlated with knowledge, while gender and urban/rural residence were not significant predictors.

Conclusions: Education was the primary determinant of asthma knowledge in this cohort, with notable deficiencies in medication adherence and inhaler awareness. Tailored educational interventions focusing on these gaps may improve management outcomes.

Key words: Asthma knowledge, Patient education, Medication adherence, Health literacy, Socio-demographic factors, Inhaler awareness

Copy Right: The Authors retain the copyrights of this article, with first publication rights granted to Medsci Publications.

License Term: Creative Commons Attribution-Share Alike (CC BY-SA) 4.0

Publisher: Medsci Publications [www.medscipublications.com]

ISSN: 2249 4995

Official website: www.njmr.in

INTRODUCTION

Asthma remains one of the most prevalent chronic respiratory diseases globally, affecting over 262 million people and causing nearly 500,000 deaths annually despite the availability of effective therapy.[1] Optimal asthma control depends not only on pharmacological interventions but also on patient knowledge, self-management skills, and adherence to prescribed medications.[2,3] Studies have consistently shown that inadequate understanding of asthma pathophysiology, poor inhaler technique, and low adherence contribute significantly to poor disease outcomes and increased healthcare utilization.[4-6]

Health literacy and educational interventions play pivotal roles in shaping asthma self-management behavior. Patients with higher literacy and formal education often demonstrate superior knowledge of triggers, medication use, and monitoring.[7] Conversely, limited awareness of inhaler devices, underuse of preventive medications, and misconceptions regarding chronic therapy remain common barriers in both developed and developing countries.[8-10]

Socio-demographic determinants such as age, education, income, and urban-rural disparities further influence asthma knowledge and adherence patterns.[11-14] While community-based interventions and structured education programs have demonstrated improvements in disease control and quality of life [15-16], gaps in knowledge persist across populations. Recent studies in diverse settings highlight the ongoing challenge of translating asthma guidelines into effective patient understanding and sustained adherence [17-18].

The present study aims to assess asthma-related knowledge among Indian adults attending a tertiary care center, identify socio-demographic predictors, and delineate key areas of knowledge deficit. Findings will inform context-specific educational strategies to enhance asthma self-management and improve long-term outcomes.

MATERIALS AND METHODS

This cross-sectional, hospital-based observational study was carried out in the Department of Respiratory Medicine at a tertiary care centre in central Kerala, over a period of three months. The study population comprised known cases of bronchial asthma attending the outpatient department (OPD). The patients were consecutively enrolled after screening for eligibility. The primary outcome was the level of asthma knowledge of the patients.

Adults aged 18 years and above, with a clinical or spirometry-confirmed diagnosis of bronchial asthma were included. Patients who declined consent and those with other chronic respiratory diseases such as COPD, bronchiectasis, interstitial lung disease, or lung cancer, as well as pregnant and lactating women, were excluded. The sample size was calculated assuming asthma knowledge prevalence 50%, a confidence level of 95%,

and an allowable error of 10%, yielding a minimum required sample size of 96 using standard prevalence study sample size formula, which was rounded up to 100 to account for potential dropouts and to ensure adequate statistical power.

Data collection was initiated after obtaining approval from Institutional Ethics Committee. Written informed consent was obtained from the participants in local language. Information was gathered through face-to-face interviews using a structured, pre-validated questionnaire developed in accordance with the GINA guidelines. The questionnaire consisted of 28 items across six domains aetiology, pathophysiology, symptoms and severity, medications, prevention, and natural history. Each response was scored dichotomously (1 for correct/knowledgeable and 0 for incorrect/uncertain), and a composite knowledge score was computed, with a maximum possible score of 28.

Statistical Analysis: Data collected from the study participants were entered into Microsoft Excel and subsequently analyzed using IBM SPSS Statistics version 25. Descriptive statistics were used to summarize the study variables. Numerical variables, such as age, were expressed as mean \pm standard deviation (SD), while categorical variables, including gender, education level, and place of residence, were expressed as frequencies and percentages.

Associations between socio-demographic characteristics and asthma knowledge were assessed using inferential tests. The Chi-square test (χ^2) was applied to determine the associations between categorical variables such as gender, age group, education level, and residence with individual knowledge items. Independent sample t-tests were used to compare mean knowledge scores between the two groups (e.g., male vs. female; urban vs. rural), while one-way analysis of variance (ANOVA) was applied to compare mean knowledge scores across multiple education categories. Pearson's correlation coefficient was used to examine the relationship between continuous variables, such as age and overall knowledge score.

To identify independent predictors of high asthma knowledge, binary logistic regression analysis was performed, adjusting for potential confounders including age, gender, residence, and education level. Model fit was assessed using the Likelihood Ratio Chi-square statistic, and effect sizes were expressed as odds ratios (OR) with 95% confidence intervals. A p-value <0.05 was considered statistically significant for all analyses.

RESULTS

A total of 100 participants were included in this cross-sectional study, with a mean age of 45.5 years. The majority belonged to the 41-60-year age group (41%), and there was a striking predominance of females (80%) compared to males (20%). Slightly more participants were from rural areas (54%) than from urban (46%) areas. Educational status varied widely, with 43% of partici-

pants having a higher education (graduate or post-graduate), while 3% were uneducated. This profile reflects a predominantly middle-aged, rural, and female cohort with a heterogeneous educational background (Table 1).

The knowledge assessment revealed that participants generally recognized the key triggers and symptoms of asthma. More than 85% correctly identified allergy and air pollution as triggers, understood that asthma can be controlled, recognized wheeze as a cardinal symptom, and acknowledged the role of inhalation therapy and trigger avoidance in disease control. Awareness was moderate regarding regular long-term medication use (84%), hereditary risk (78%), the seriousness of asthma attacks (73%), common cold as a trigger (72%), and the incurability of asthma (60%), with 60–84% answering correctly. However, substantial gaps were noted in three areas: only 55% understood the need to continue medication as prescribed, 39% were aware of pulmonary function tests (PFTs) for assessing severity, and only 24% could differentiate types of inhalers. These results highlight that while symptom awareness was strong, understanding of disease monitoring and inhaler usage was poor (Table 2).

The analysis of associations between demographics and asthma knowledge showed mixed results. Gender differences were minimal, with the only significant finding being greater awareness among females regarding the role of PFTs in asthma assessment ($\chi^2 = 7.289$, $p = 0.026$) (Table 3). Education, however, was strongly associated with better knowledge: participants with higher educational attainment demonstrated a greater understanding of air pollution as a trigger ($p = 0.009$) and of asthma's hereditary component ($p = 0.022$) (Table 3). Residence had no significant influence, as the urban and rural participants displayed comparable levels of knowledge (Table 3). Age was another important factor: younger individuals had significantly better knowledge of air pollution triggers ($p = 0.028$) and hereditary factors ($p = 0.008$), with a negative correlation between age and overall knowledge score ($r = -0.38$, $p < 0.001$), suggesting that older participants were less familiar with contemporary asthma concepts (Table 4).

When knowledge scores were compared more broadly, females tended to score slightly higher than males, although the difference was not statistically significant ($p = 0.07$). Urban and rural residents had virtually identical scores ($p = 0.90$), confirming that place of residence did not affect knowledge levels (Table 4). Education, on the other hand, showed a strong positive correlation with knowledge ($F = 4.38$, $p = 0.0012$), establishing it as the most consistent determinant (Table 4).

Multivariate logistic regression further confirmed that education was the only independent predictor of high asthma knowledge. Each incremental step in education level increased the odds of a higher knowledge score by 55% (OR = 1.55, 95% CI: 1.06–2.29, $p = 0.025$). Age (OR = 0.99, $p = 0.426$), gender (OR = 0.38, $p = 0.124$), and

residence (OR = 0.98, $p = 0.968$) were not independently significant predictors once adjusted together in the model. The regression model demonstrated a good overall fit (Likelihood Ratio $\chi^2 = 16.17$, $p = 0.0028$) with a pseudo- R^2 of 0.12, indicating that education explained a significant proportion of the variance in asthma knowledge (Table 5).

Table 1: Baseline demographic profile of participants (N = 100)

Variable	Participants (%)
Age (years)	
Mean \pm SD	45.5 \pm 15.7
≤ 25 years	11 (11.0)
26–40 years	29 (29.0)
41–60 years	41 (41.0)
>60 years	19 (19.0)
Gender	
Female	80 (80.0)
Male	20 (20.0)
Residence	
Rural	54 (54.0)
Urban	46 (46.0)
Education Level	
Uneducated	3 (3.0)
Below 10th standard	15 (15.0)
10th standard	26 (26.0)
12th standard	13 (13.0)
Diploma/Degree	31 (31.0)
Postgraduate	12 (12.0)

Table 2: Asthma knowledge domains assessed (N = 100)

Knowledge Domain	Correct (%)	Incorrect (%)	Uncertain (%)
Allergy as trigger	92	6	2
Air pollution as trigger	92	3	5
Asthma can be controlled	90	3	7
Wheeze as symptom	89	8	3
Inhalation is best delivery	87	5	8
Trigger avoidance helps control	86	6	8
Regular medication prevents symptoms	84	8	8
Hereditary component	78	7	15
Asthma attacks are dangerous	73	8	19
Common cold as trigger	72	22	6
Asthma cannot be cured	60	26	14
Continue medication as advised	55	14	31
Pulmonary Function Test for severity	39	32	29
Types of inhalers	24	20	56

Table 3: Association between demographics and asthma knowledge

Factor	Knowledge Domain	p-value
Gender	PFT for severity	0.026
	Other domains (13)	>0.05
Education	Air pollution trigger	0.009
	Hereditary component	0.022
Age group	Air pollution trigger	0.028
	Hereditary component	0.008
residence	All domains	>0.05

Table 4: Correlation between knowledge score and demographics

Predictor	Statistical Test	Statistic	p-value
Age	Pearson correlation	r = -0.38	<0.001
Gender	Independent t-test	t = 1.89	0.07
Residence	Independent t-test	t = 0.12	0.90
Education	ANOVA	F = 4.38	0.0012

Table 5: Multivariate logistic regression: predictors of high asthma knowledge

Factor	Odds Ratio (95% CI)	p-value
Age (years)	0.99 (0.95-1.02)	0.426
Gender (Female vs Male)	0.38 (0.11-1.31)	0.124
Residence (Urban vs Rural)	0.98 (0.42-2.34)	0.968
Education (per level ↑)	1.55 (1.06-2.29)	0.025

DISCUSSION

The present cross-sectional study assessed the level of asthma knowledge and inhaler techniques among patients attending the Respiratory Medicine OPD of a tertiary care centre in Kerala. The findings reveal important knowledge strengths and significant gaps, particularly in awareness regarding types of inhalers, objective severity assessment tools, and the need for long-term medication adherence. These results have relevant clinical and public health implications and are in concordance with previous research from India and abroad.

This study identified substantial variability in asthma knowledge among adult patients, with education emerging as the principal determinant of higher awareness levels. These findings corroborate international evidence linking educational attainment to improved disease understanding and management behaviors.[7,9,11] Limited health literacy has been shown to significantly impede asthma self-management and treatment adherence, with multiple studies consistently demonstrating a strong association between literacy levels and asthma-related outcomes across different populations.[18]

Consistent with global evidence, our study demonstrated that although most participants were able to identify common asthma triggers such as allergens and air pollution, understanding of medication adherence and differentiation between inhaler devices remained suboptimal. Similar findings have been reported across diverse adult populations, where correct inhaler technique proficiency frequently remains below 30-40%.[8,13]. Inadequate education regarding inhaler use continues to represent a major barrier to effective asthma control worldwide.[5,8] Systematic reviews further highlight that improper inhaler technique results in subtherapeutic drug delivery and poor symptom control, irrespective of the pharmacological efficacy of the prescribed medication.[6]

Socio-demographic determinants beyond education, such as age and place of residence, showed weaker associations in our cohort, consistent with findings from other settings where urban-rural differences in

knowledge were minimal after adjusting for education and income.[8,18] However, younger patients generally demonstrated better awareness, possibly reflecting greater digital engagement and access to health information

Medication adherence, a central element of asthma management, continues to pose a global challenge, with rates of nonadherence ranging from 30-70%.[3,5] Psychological, cultural, and health system barriers often compound behavioral factors. Evidence suggests that continuous patient education, reinforcement of inhaler demonstrations, and integration of self-management plans significantly improve adherence and clinical outcomes.[16,17,13]

Educational interventions have demonstrated measurable benefits in improving asthma knowledge and inhaler technique.[2] Structured self-management education programs have been shown to significantly enhance disease control and medication use competence.[2,17] However, the sustainability of these gains remains a concern, as evidence suggests that without periodic reinforcement, patients often revert to incorrect practices within months.[2,6]

Globally, the paradigm of asthma care is shifting toward patient-centered, education-driven management frameworks. This approach is supported by evidence linking self-efficacy and patient empowerment to reduced exacerbations and improved quality of life. In low- and middle-income countries, however, systemic constraints such as limited access to pulmonary educators, cultural beliefs, and language barriers continue to impede programmatic success.[7,13]

Our findings reinforce that improving asthma outcomes necessitates comprehensive educational programs tailored to patient literacy levels, periodic skill reassessment, and culturally sensitive materials. Incorporating digital education modules, community pharmacists, and family-centered teaching could further bridge knowledge gaps. Future research should explore longitudinal effects of such interventions and assess their scalability across India and similar settings.

This study is limited by its self-reported data collection, single-center and cross-sectional design, and the consequent restriction in generalizability of the findings to broader populations.

LIMITATIONS

This study has certain limitations. Its single-centre, cross-sectional design and modest sample size limit the generalizability of the findings to broader populations. Asthma knowledge was assessed using a self-reported questionnaire, which may be subject to recall bias and social desirability bias, potentially leading to overestimation of knowledge levels. In addition, causal relationships between demographic factors and asthma knowledge could not be established due to the observational nature of the study.

CONCLUSION

This study found that adult asthma patients had good awareness of symptoms and common triggers, but significant gaps persisted in understanding inhaler types, objective disease monitoring, and long-term medication adherence. Educational level was the only independent predictor of asthma knowledge, while age showed a negative association. These findings highlight the need for focused educational interventions targeting less-educated and older patients to improve asthma self-management and optimize disease control

Individual Author's Contribution: **URB** contributed to study conception, study design, data collection, data analysis and interpretation, and manuscript preparation. **VNS** contributed to study conception, study design, data analysis and interpretation, and manuscript preparation. **SR** and **SA** contributed to data collection and manuscript preparation.

Availability of data: The data that support the findings of this study are available from the corresponding author on reasonable request.

Declaration of Non-use of generative AI Tools: This article was prepared without the use of generative AI tools for content creation, analysis, or data generation. All findings and interpretations are based solely on the authors' independent work and expertise.

REFERENCES

- Global Initiative for Asthma (GINA). Global strategy for asthma management and prevention. 2024. Available from: https://ginasthma.org/wp-content/uploads/2024/05/GINA-2024-Strategy-Report-24_05_22_WMS.pdf. [Accessed on Dec 15, 2026]
- Ali WG, Abou Elmaati H. Self-management program to improve asthma knowledge and inhaler technique among adult with asthma. *IOSR J Nurs Heal Sci*. 2016;5(2):37-47. Available from: <https://iosrjournals.org/iosr-jnhs/papers/vol5-issue2/Version-6/E0502063747.pdf>
- Kebede B, Mamo G. Determinants of non-adherence to inhaled steroids in adult asthmatic patients on follow up in referral hospital, Ethiopia: cross-sectional study. *Asthma Res Pract*. 2019 Dec 30;5:5. DOI: <https://doi.org/10.1186/s40733-019-0053-1> PMID:31893127 PMCID:PMC6937669
- Abegaz TM, Shegena EA, Gessie NF, Gebreyohannes EA, Seid MA. Barriers to and competency with the use of metered dose inhaler and its impact on disease control among adult asthmatic patients in Ethiopia. *BMC Pulm Med*. 2020 Feb 21;20(1):48. DOI: <https://doi.org/10.1186/s12890-020-1081-6>. Erratum in: *BMC Pulm Med*. 2020 Apr 20;20(1):95. DOI: <https://doi.org/10.1186/s12890-020-1122-1>. PMID: 32085726 PMCID: PMC7035747
- Rafi MA, Tahmin CI, Tashrik S, Bonna AS, Jannat F, Mily SJ, et al. Adherence to inhalers and associated factors among adult asthma patients: an outpatient-based study in a tertiary hospital of Rajshahi, Bangladesh. *Asthma Res Pract*. 2022 Feb 9;8(1):1. DOI: <https://doi.org/10.1186/s40733-022-00083-7> PMID:35139927
- Zelalem BK, Mamo G, Feiysa D. Effect of Intervention on Metered Dose Inhaler Use Technique and Determinants among Adult Asthmatic Patients Attending in Outpatient Clinic, Ethiopia: Interventional Study. *Int J Respir Pulm Med*. 2020;7:136. DOI: <https://doi.org/10.23937/2378-3516/1410136>
- Salim H, Shariff Ghazali S, Lee PY, Cheong AT, Harrun NH, Mohamed Isa S, Pinnock H. Health literacy levels and its determinants among people with asthma in Malaysian primary healthcare settings: a cross-sectional study. *BMC public health*. 2021 Jun 22;21(1):1186. DOI: <https://doi.org/10.1186/s12889-021-11194-w>
- Shayo GA, Omary A, Mugusi F. Inhaler Non-Adherence, Associated Factors and Asthma Control among Asthma Patients in a Tertiary Level Hospital in Tanzania. *East Afr Health Res J*. 2022;6(1):78-85. DOI: <https://doi.org/10.24248/eahrj.v6i1.682> PMID:36424951 PMCID:PMC9639640
- Makki S, Siddiqua A, Alqahtani BA, Alkhuwaylidi H, Alhefzi L, Hussain M, et al. A cross-sectional study on the self-management of asthma and asthma control among adult asthmatic patients in the Aseer region, KSA. *Sci Rep*. 2024 Jul 12;14(1):16095. DOI: <https://doi.org/10.1038/s41598-024-67136-0> PMID:38997509
- Maulood KB, Khan M, Syed Sulaiman SA, Khan AH. Assessing the Impact of Health Education Intervention on Asthma Knowledge, Attitudes, and Practices: A Cross-Sectional Study in Erbil, Iraq. *Healthcare (Basel)*. 2023 Jun 29;11(13):1886. DOI: <https://doi.org/10.3390/healthcare11131886> PMID:37444720
- D'Antoni D, Smith L, Auyeung V, Weinman J. Psychosocial and demographic predictors of adherence and non-adherence to health advice accompanying air quality warning systems: a systematic review. *Environ Health*. 2017 Sep 22;16(1):100. DOI: <https://doi.org/10.1186/s12940-017-0307-4> PMID:28938911
- Gare MB, Godana GH, Zewdu B. Knowledge, attitude, and practice assessment of adult asthmatic patients towards pharmacotherapy of asthma at Jimma university specialized hospital. *EC Pulmonology and Respiratory Medicine*. 2020;9(2):1-10.
- Iqbal MZ, Alqahtani SS, Shahid S, Mubarak N. Socio-demographic environmental and clinical factors influencing asthma control in community pharmacies of Lahore Pakistan. *Scientific Reports*. 2025 Mar 27;15(1):10587. DOI: <https://doi.org/10.1038/s41598-025-95373-4> PMID:40148570 PMCID:PMC11950406
- Eissa HSM, Farahat TM, Hegazy NN, Ali Barakat AM. Outcome of An Educational Program on Bronchial Asthma Self-Management. *The Egyptian Journal of Hospital Medicine*. 2020;81(3):1699-1703.
- Gebresilassie TG, Worku A, Ahmed AA, Kabeta ND. Effect of asthma education intervention on self-management knowledge and control level in Tigray, Northern Ethiopia: a quasi-experimental study. *BMC Pulmonary Medicine*. 2025 Mar 15;25(1):120. DOI: <https://doi.org/10.1186/s12890-025-03574-4> PMID:40089702
- Zewdie S, Mekuria B, Alemu BK, Bayked EM, NurAhmed Toleha H, Ayenew W, Andargie A. Prevalence of medication adherence among adult asthmatic patients in four African countries: A systematic review and meta-analysis. *World Allergy Organ J*. 2024 Jan 19;17(2):100870. DOI: <https://doi.org/10.1016/j.waojou.2024.100870>. PMID: 38304621
- Das KK, Hossain MA, Paul N, Rahman MH, Dutta AK, Dutta PK. Knowledge, Attitude and Practices on Use Of Metered Dose Inhalers Among Bronchial Asthma Patients in a Tertiary Care Hospital. *Journal of Chittagong Medical College Teachers' Association*. 2018 Feb 10;28(2):46-52. DOI: <https://doi.org/10.3329/jcmcta.v28i2.62421>
- Madhushani HPD, Subasinghe HWAS. Knowledge attitudes and practices of asthma; Does it associate with demographic factors of adult patients?. *APJHS*. 2016Dec.31;3(4(S)):94-99. Available from: <https://www.apjhs.com/index.php/apjhs/article/view/584/490>