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Asthma beyond the clinic: a decade-long narrative review of parental knowledge and practices in Indian children

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Abstract

This narrative review explores parental knowledge, attitudes, and practices (KAP) toward childhood asthma in India, covering aspects of disease etiology, stigma, trigger avoidance, and management, and their overall impact on asthma control and outcomes. A total of 17 studies from 2014 to 2024 focusing on parental KAP were analyzed, excluding those centered on healthcare providers or lacking KAP-compliance correlation. This review reveals widespread parental misconceptions, stigma, and poor knowledge about childhood asthma in India, influenced by regional and socioeconomic factors. Fear of inhalers, use of alternative therapies, and cost barriers to treatment are common. Improved, culturally tailored education and policy efforts are needed to enhance asthma care and outcomes. Parental KAP significantly influences asthma control, with gaps caused by misconceptions, cultural beliefs, and poor practices. Regional disparities highlight the need for context-specific strategies. Despite various global and national asthma guidelines, parental knowledge and practices in India remain poor. Culturally tailored education, community engagement, and policy support are essential to improve parental compliance and childhood asthma outcomes, particularly in underserved regions.

Key words: childhood asthma, pediatrics, knowledge, attitudes and practices, review, India.

Introduction

Asthma is one of the most common chronic diseases affecting children worldwide, and it has emerged as a significant public health concern, especially in low- and middle-income countries. The World Health Organization estimates that over 339 million people globally suffer from asthma, and its prevalence continues to rise, particularly among pediatric populations [1]. Yet, this largely preventable and manageable disease still claims nearly 1,000 lives every day, reflecting critical failures in global health systems to ensure timely diagnosis, equitable access, and effective long-term care [2]. The recent Global Burden of Disease (GBD, 1990–2019) estimated the total burden of asthma in India as 34.3 million, accounting for 13.09% of the global burden. It also attributed that there were 13.2 per thousand deaths due to asthma in India. Asthma accounted for 27.9% of disability-adjusted life years (DALYs) in the Indian population [3]. According to Global Asthma Network (GAN) phase 1, the prevalence of current wheeze is 3.16%, 3.63% and 3.30% in the 6–7 years, 13–14 years and adults, respectively [4]. However, fewer than 30% of individuals with current wheeze had a doctor-confirmed asthma diagnosis. Underdiagnosis and stigma may obscure the true burden. Among those diagnosed, fewer than 10% used inhaled corticosteroids (ICS) daily. Additionally, over 25% required hospitalization at least once a year, likely due to inadequate treatment [5]. A systematic review and meta-analysis of 33 studies involving 167,626 children in India estimated the pooled prevalence of asthma to be 7.9% (95% CI: 6.3–9.6%), with higher rates observed in boys and urban areas [6].

The disease imposes a substantial impact on quality of life, school attendance, healthcare utilization, and financial burden on families. Among children aged 6–7 years with current wheeze, school absenteeism was noted in 66.1% with a doctor diagnosis of asthma and 2.5% without. In the 13–14-year age group, absenteeism was 52.7% with a diagnosis and 24.0% without [5]. According to the Global Asthma Report 2022, individuals with low income may spend up to 80% of their personal savings on asthma medications, highlighting the substantial financial burden and limited affordability of essential treatment in resource-constrained settings [5].

Asthma management in children is particularly complex due to the need for consistent adherence to medication, recognition of early symptoms, and avoidance of triggers. Parents and primary caregivers play a pivotal role in this process. It is well-established that parental knowledge, attitudes, and practices (KAP) significantly affect how well a child's asthma is

managed. A lack of knowledge or presence of misconceptions can lead to poor disease control, frequent exacerbations, and unnecessary hospital admissions [7,8].

Despite the availability of effective management guidelines such as the Global Initiative for Asthma (GINA), parental compliance with recommended treatment protocols remains variable. Misconceptions about asthma and its treatment, lack of patient involvement in care decisions, and inadequate self-management education can significantly impede optimal asthma control [9]. Furthermore, poor practices, including irregular follow-up, self-medication, and delay in seeking care, contribute to the gap between recommended and actual management of asthma in children [10].

This narrative review aims to explore existing literature on parental KAP toward childhood asthma, highlight the correlation between these variables and treatment compliance, and provide a basis for policy recommendations and future interventions. The synthesis of available evidence across different geographic and sociodemographic settings provides a broader understanding of the challenges and potential solutions for improving childhood asthma outcomes in resource-constrained settings.

Methods

A search was conducted for studies published between January 2014 and December 2024 across major academic databases, including PubMed, Scopus, Web of Science, and Google Scholar. The search incorporated predefined combinations of keywords and Boolean operators related to asthma, children, caregivers, knowledge, attitude and practice (KAP), and India. A representative search string used was:

("asthma" OR "bronchial asthma") AND ("child" OR "pediatric" OR "paediatric") AND ("parent" OR "caregiver*") AND ("knowledge" OR "attitude" OR "practice" OR "KAP") AND ("India").

The initial search identified 1,256 records. An additional 32 studies were obtained through manual searching of reference lists and citations. After the removal of 342 duplicates, a total of 946 records remained for title and abstract screening. Following screening, 812 records were excluded due to irrelevance, duplication of research questions, or non-Indian context.

A total of 134 full-text articles were assessed for eligibility. Among these, 117 were excluded, including studies with adult populations (38), studies without KAP components (42), non-Indian studies (21), and studies lacking sufficient methodological detail (16). Ultimately, 17 peer-reviewed studies met the inclusion criteria and were included in the qualitative narrative

synthesis (Figure 1). All studies focused on parental knowledge, attitudes, and practices toward childhood asthma management in Indian hospital-based or community-based settings and used structured KAP questionnaires. This review included seventeen peer-reviewed studies conducted between 2014 and 2024, (Figure 1) selected based on their focus on parental knowledge, attitudes, and practices toward childhood asthma management. The studies were sourced from academic databases and included research from both hospital-based and community-based settings in India. The studies utilized structured KAP questionnaires to assess the level of parental understanding and behavior related to asthma [8,11-26].

Inclusion criteria required that the studies be original research articles involving parents or primary caregivers of children diagnosed with bronchial asthma. Studies were excluded if they focused on healthcare provider perspectives or did not explicitly analyze the correlation between KAP and treatment compliance. Both qualitative and quantitative studies were reviewed, although quantitative findings formed the primary basis of the narrative synthesis.

Data extraction was conducted in a structured manner. For each study, information on sample size, study location, study design, assessment tools, and major findings across the knowledge, attitude, and practice domains was recorded. The extracted data also included any reported associations between parental KAP and treatment compliance. After extraction, the data were organised under predefined thematic categories to allow consistent comparison across studies. These themes included parental understanding of asthma, misconceptions and stigma, medication beliefs, and treatment-related behaviours. Quantitative findings were summarised descriptively, while qualitative insights were used to contextualise behaviours and beliefs. The final synthesis compared patterns across different regions of India to highlight common gaps, regional variations, and programmatic implications for strengthening childhood asthma control.

Results

Across the reviewed studies, a consistent pattern emerged: parents exhibited significant knowledge gaps regarding causes, symptoms, and treatment of asthma. In South India, a hospital-based study from Tamil Nadu reported that 80% of parents had no knowledge about ICS, and 86% were unaware of the role of ICS in asthma management [11]. In Kerala, only 36% of parents were aware of asthma diagnosis in their children [12]. Similarly, at a tertiary care centre in Karnataka, despite an average of three prior medical consultations, more than two-thirds of caregivers were unaware that their children had bronchial asthma [13] (Table 1).

In the West, a study from Ahmedabad found that over half of parents had only average attitudes toward asthma prevention and control, especially regarding the use and discontinuation of controller medications [14]. From North India, concerning trends were also noted 44% of parents in Punjab believed asthma was untreatable, revealing major misconceptions about disease prognosis [15]. However, there is a notable lack of KAP data from Eastern India, indicating a significant research gap in this underserved region. These findings highlight regional disparities and widespread parental knowledge gaps that may hinder effective asthma management across India.

These knowledge gaps are compounded by widespread misconceptions regarding the aetiology of asthma. In Delhi, 53% of parents believed asthma was contagious, with airborne transmission cited as the most common route [16]. In Rajasthan, 40% of parents recognized asthma being hereditary while 2% thought that asthma was contagious [8]. From the southern states, similar patterns emerged. In Andhra Pradesh, 60% of parents attributed asthma to hereditary causes, while only 1.43% believed it was contagious [17]. In Karnataka, 77% of parents lacked awareness about the disease's aetiology [13], and in Puducherry and Kerala, 18% and 23% of respondents, respectively, held the misconception that asthma was contagious [12,18]. These findings indicate that myths and misinformation surrounding asthma are widespread, contributing to delayed diagnosis, and poor disease management across regions.

Such misconceptions often translate into stigma and attitudinal barriers, which further impede the management of childhood asthma. In Puducherry, 58.9% of parents expressed embarrassment regarding their child's asthma diagnosis [18], while in Karnataka and Kerala, 54% and 35% of parents, respectively, were reluctant to accept the diagnosis [12,13]. In Ahmedabad, 36.7% of parents hesitated to disclose the condition of their children [14], and in Jammu, 34% showed reluctance to acknowledge the diagnosis [19]. The stigma extended beyond family settings and impacted children's social inclusion. In Karnataka, 32.7% of parents reported negative attitudes from teachers, 23.3% noted hesitation in allowing participation in school trips, and 19.3% believed asthmatic children should not mix with others [13]. In Andhra Pradesh, myths about contagion led to children being isolated even within the household [17].

The lack of awareness also extends to disease perception and prognosis. Many parents across various states did not recognize asthma as a chronic, manageable condition. In Puducherry and Karnataka, 33.9% and 36.4% of parents, respectively, believed asthma could be cured,

and 41% in Karnataka mistakenly considered asthma fatal [13,18]. In Maharashtra, although 41.7% acknowledged asthma as chronic, most were unaware of its long-term nature [20]. In Kerala, nearly 29% of parents were unaware that asthma can cause recurring symptoms, and over 62% did not realize that asthma persists even when no symptoms are present [21]. In Rajasthan and Delhi, 35% and 63% of parents, respectively, believed in a permanent cure via Ayurveda or Homeopathy [8,16]. These misconceptions may significantly affect treatment adherence and long-term disease control.

Medication practices reflect these underlying beliefs. In Rajasthan, 32% of parents preferred oral medications and resorted to emergency departments during attacks [8], while in Delhi, only 16% opted for aerosol therapy and 42% preferred oral routes [16]. In Maharashtra, merely 22.6% believed that inhalation therapy had fewer side effects than oral drugs [20]. In Karnataka, oral medications were the first choice for 79% of parents, with only 21% adhering to inhaler use [13], and in Kerala, only 15% of children were using inhalers, of whom 85% were non-compliant [12]. These findings reveal a broad reluctance to adopt inhalation therapy, often driven by perceived harms.

Fear of side effects and dependence plays a critical role in these choices. In Puducherry, 52% feared that asthma medications could lead to addiction [18], while in Rajasthan, nearly half expressed concerns about dependence, and 13.2% believed these drugs could impair immunity [8]. In Karnataka, 43.3% advised against inhaler use for fear of lifelong dependence [13]. In West Bengal, even among those who received physician-led education, concerns about side effects (91%), addiction (81.7%), and stigma (62.7%) remained high. This results in usage of inhaler along with spacer in only 40% and only 36% parents believed that inhalation therapy was better [22]. Similarly, in Andhra Pradesh, fears of harm (14.28%), weakened immunity (30%), and addiction (41.43%) were prevalent [17]. These findings highlight the urgency of addressing these beliefs through behavior change communication.

Parents' limited understanding of asthma triggers further exacerbates the problem. While 90% of parents in Andhra Pradesh identified tobacco smoke as a trigger [17], only 54% in Karnataka were aware of their child's specific triggers—and of these, only 71.6% actively avoided them [13]. In Tamil Nadu, although 62% recognized tobacco-related harm, fewer understood risks from air pollution (47%) or poor control leading to emergencies (52%) [23]. In Kerala, 47% of parents were unaware of everyday triggers such as perfumes or air fresheners, and 25% imposed unnecessary dietary restrictions [12]. In Delhi, common triggers cited included house dust (70%) and seasonal changes (54%), but only 14% mentioned indoor allergens, and 25%

incorrectly blamed processed foods. Although 63% believed allergies could be prevented, practical measures were lacking—only 31% mentioned face masks, 16% smoking avoidance, and 11% air purifiers [16].

Knowledge about diagnostic options and advanced therapies like immunotherapy was severely limited. In Delhi, half of the parents thought blood tests could diagnose allergies, while only 8% knew about skin prick testing, and 48% had no knowledge of any diagnostic method [16]. Immunotherapy awareness was almost nonexistent, pointing to critical gaps in understanding full clinical management options of asthma.

This inadequate knowledge translated into poor healthcare-seeking behaviors. Only 9% of parents in Jammu sought medical help within six hours of symptom onset [19], and in Ahmedabad, over 60% of parents did not maintain symptom charts [14]. In Tamil Nadu, 87% had never used the Children's Asthma Control Test and 78% lacked a written action plan [11], while another study noted that only 24% knew about reliever inhalers and just 52% were aware of controller medications and action plans [23]. In Kerala, 35% of parents practiced unsupervised self-nebulization and 13% used OTC steroids during attacks. Although 90% acknowledged the need for emergency measures, most used oral bronchodilators from old prescriptions. Only 6.6% followed a written action plan, and many failed to teach children emergency protocols or notify teachers. Over 30% were unaware of the correct posture during attacks, and more than half neglected to clean inhalers or rinse mouths after corticosteroid use [24].

Economic challenges further reduced adherence. In Puducherry, 40% cited cost as a barrier [18], and in Ahmedabad, 61.1% missed or discontinued inhaler use due to financial constraints [14]. In West Bengal almost 32% considered the therapy too costly [22].

Sociodemographic factors such as maternal education, urban residence, and family history of asthma were positively linked to better KAP scores [8,19,20]. Mothers, often the primary caregivers, showed better recognition of asthma symptoms, even if less educated than fathers [18]. Urban parents had better access to information and services, leading to higher compliance. In Kerala, maternal age, education, and information sources influenced knowledge levels [25]. Diagnosis acceptance was higher among upper and middle classes compared to lower classes [12], and SES-related disparities in inhaler use were striking—only 2.2% of children from lower SES families used inhalers, with 84% of non-users from this group reluctant to begin therapy. These differences were also reflected in asthma control and

understanding of medications [21], with particularly low MDI literacy among poorer families [26].

Amidst biomedical hesitancy, alternative therapy use was widespread. In Delhi, two-thirds of parents relied on remedies such as steam inhalation (26%), honey (18%), aloe vera (8%), and gargles (7%) [16]. In Karnataka, nearly half opted for alternative systems, with one-third preferring homeopathy [13]. In Kerala, 36% used Ayurveda and 80.6% had tried homeopathy, with 30% using these long-term [12]. In Rajasthan, 'Kada' was reported as a popular remedy [24]. These trends reflect a deep-seated reliance on traditional beliefs and underline the need for culturally attuned, evidence-based asthma education to improve treatment outcomes.

Despite these barriers, better practices were observed among parents of children with positive family history of asthma and persistent asthma symptoms [18], severe asthma and those more familiar with symptom monitoring. For example, in Ahmedabad, parents of children with severe asthma demonstrated improved knowledge and practices ($p < 0.05$), and peak flow meter awareness was significantly higher among parents of children with intermittent asthma ($p < 0.001$) [14].

Higher parental knowledge consistently correlated with better compliance and care. In Andhra Pradesh, knowledgeable parents were more likely to understand etiology, adhere to medication schedules, and avoid triggers [17]. In West Bengal, higher education among caregivers correlated significantly with better treatment compliance ($p < 0.05$) [22]. However, knowledge alone did not always result in better attitudes. In Ahmedabad, some parents with high knowledge scores still had poor practices [14], and in Tamil Nadu and Puducherry, negative beliefs about inhalers persisted despite awareness [11,18].

Discussion

The synthesis of parental knowledge, attitudes, and practices (KAP) regarding childhood asthma in India highlights systemic, sociocultural, and behavioral barriers that extend beyond basic informational gaps. These findings reflect a complex interplay of belief systems, cognitive dissonance, social stigma, and healthcare access disparities that collectively hinder effective disease management.

A fundamental misunderstanding lies in the perception of asthma's chronicity. Parents often view illnesses in binary terms either curable or fatal. Asthma, with its episodic symptoms and need for continuous yet often invisible treatment, does not align with this dichotomy. As posited by the Health Belief Model (HBM), perceived susceptibility and severity are central to

engaging in health-promoting behaviors [27]. However, when asthma is misconstrued as an acute or curable condition, the perceived need for maintenance therapy diminishes. Many caregivers continue to believe that asthma can be permanently cured through traditional medicine, demonstrating an epistemological conflict between biomedical paradigms and traditional health beliefs. This is not a mere knowledge deficit but a discordant understanding of disease ontology that undermines long-term adherence.

Stigma further compounds this problem. Feelings of embarrassment, social withdrawal, and diagnostic denial are not isolated responses but are shaped by dominant community narratives that portray chronic illnesses as weakness or contamination. According to the Theory of Planned Behavior, such social norms, along with low perceived behavioural control, contribute to avoidance behaviors even among informed parents [28]. The reluctance to accept the diagnosis, refusal to allow children to participate in school activities, and concerns, especially among parents of girls, that an asthma diagnosis could impede future marriage prospects, illustrate how deeply entrenched stigma can deter care-seeking and routine management [29,30].

Even within the healthcare system, stigma operates covertly. Healthcare providers may unintentionally reinforce parental alienation by relying on jargon-heavy communication or failing to engage with cultural beliefs empathetically. Despite receiving information from physicians, many parents continue to fear inhaler addiction or medication-related immunosuppression [31,32]. This points to a communication breakdown in the physician-parent interface, where the transfer of information does not equate to trust or behavioural change. The persistence of these fears, even post-counselling, suggests that health education efforts must be better aligned with psychological readiness and cultural sensitivity.

Structural barriers further exacerbate this behavioural inertia. The lack of affordable inhalers, the absence of written action plans, and the limited availability of diagnostic facilities collectively point to a healthcare infrastructure not well-adapted to chronic paediatric disease management in low-resource settings [33,34]. Andersen's Behavioural Model of Health Services Use underscores how enabling resources, such as income, geographic location, and educational background, strongly shape care utilization [35]. Parents from lower socioeconomic groups are not only constrained materially but are also deprived of interpretive tools to comprehend and act on asthma management strategies. Their resistance to inhalers, for instance, reflects not only economic hardship but also symbolic opposition to what is perceived as medical dependency.

Importantly, maternal involvement emerged as a key determinant of asthma control. Although often less formally educated than fathers, mothers exhibited better symptom recognition and day-to-day management practices. Psychosocial stress is common among caregivers of inner-city children with asthma and is independently associated with increased asthma morbidity [36]. This finding is consistent with the Social Ecological Model, which emphasizes the significance of interpersonal and familial factors in health behaviour [37]. However, maternal engagement is poorly harnessed by existing programs. There is minimal integration of asthma education within maternal and child health outreach initiatives. Moreover, community health workers such as ASHAs or Anganwadi staff are rarely trained to deliver asthma-specific counselling, leaving parents to navigate complex regimens with little contextual support.

Trigger avoidance behaviours also show notable inconsistencies. While many parents can identify obvious triggers like tobacco smoke, few translate this awareness into preventive behaviour. The COM-B model (Capability, Opportunity, Motivation – Behaviour) offers a useful lens here: parents may lack psychological capability (due to anxiety), social opportunity (due to housing or social norms), or reflective motivation (due to fatalism) to sustain behavior change [38]. Educational interventions alone are unlikely to bridge this intention-action gap. What is needed are behaviorally designed programs that reinforce small, actionable changes in a sustained and contextually relevant manner.

Treatment preferences further illuminate these challenges. The widespread preference for oral medications over inhalation therapy is not merely a function of cost. Rather, it reflects cultural semiotics pills are seen as finite and familiar, while inhalers are perceived as complex, stigmatizing, and lifelong commitments. The popularity of traditional remedies such as steam inhalation, honey, or herbal decoctions underscores the symbolic comfort they offer. These treatments align with culturally sanctioned ideas of care and agency, in contrast to the alienating nature of biomedical regimens.

Thus, parental behavior in asthma care must be interpreted not as ignorance or negligence, but as a contextually rational response to the cognitive, cultural, and structural environment in which families operate. Interventions must address not just the content of information but also the meaning families assign to disease and therapy. Health messages that ignore these deeply embedded beliefs are unlikely to lead to sustained change. Instead, they risk reinforcing resistance.

To address these multilayered challenges, asthma management should be integrated into existing public health platforms. Schools, Anganwadi centers, and maternal-child health

clinics can serve as effective points of engagement. Evidence-based behavioral nudges—such as reminder cards, asthma diaries, and visual demonstrations—can improve adherence [39]. Healthcare providers must be trained in narrative-based counselling and motivational interviewing to build rapport and reshape attitudes. Economic strategies, including free inhalers through government schemes and accessible diagnostic services, should be implemented in tandem with behaviorally informed design to improve uptake and retention in care [40].

Limitations

This narrative review offers important insights into parental knowledge, attitudes, and practices (KAP) related to childhood asthma in India; however, it has several limitations. Most of the included studies are cross-sectional and hospital-based, limiting its generalizability to community settings, particularly in rural and underserved regions. The lack of longitudinal or interventional designs constrains understanding of how KAP evolves over time or in response to targeted programs. Moreover, variability in survey instruments, non-standardized definitions of “adequate knowledge” or “positive attitude,” and limited validation of tools weaken the comparability and robustness of findings. Self-reported data introduce social desirability bias, especially concerning stigma, adherence, and the use of alternative therapies. The regional focus is also uneven, with minimal representation from eastern and northeastern India. Crucially, few studies explicitly apply health behavior models, limiting their theoretical depth and practical applicability. While this narrative approach synthesizes key themes, a systematic review using rigorous inclusion criteria, quality appraisal, and meta-analysis where feasible would yield stronger, more generalizable evidence to inform national-level policy and intervention strategies.

Conclusions

This review shows that parents in India often struggle with childhood asthma because of poor awareness, common misconceptions, stigma, and barriers in the health system. To improve this, we need practical and culturally appropriate approaches that build correct knowledge, reduce fear, and encourage proper use of inhalers. Adding asthma education to existing health programmes, training frontline workers, and improving access to affordable diagnostic tools can strengthen early care. Future studies should use clearer and more systematic methods to produce strong evidence for policy.

Overall, the gaps in parental KAP are not just due to lack of information. They reflect the difference between medical advice and the daily realities of families shaped by culture, emotions, and social conditions. Public health actions should consider these realities and use simple behaviour-change models such as the Health Belief Model, Theory of Planned Behaviour, Social Ecological Model, Andersen's Model, and COM-B to design interventions that fit local needs. When behaviour change efforts match the family and community context, asthma care becomes more effective and fairer. Without this shift, avoidable problems will continue, and childhood asthma will remain a hidden burden driven by stigma, fear, and limited support.

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Figure 1. Study selection.

Table 1. Summary of study findings.

Region/State	Study setting	Knowledge gaps	Attitude issues	Practice gaps	Reference
Tamil Nadu (South India)	Hospital-based	80% unaware of ICS, 86% unaware of role	-	Poor adherence to inhaler use	[11]
Kerala	Hospital based	36% aware of diagnosis; 47% unaware of triggers	35% reluctant to accept diagnosis	Only 15% children used inhalers; 85% non-compliant	[12,21,25]
Karnataka	Tertiary care center	77% unaware of etiology	54% hesitant to accept diagnosis	79% used oral meds first; only 21% used inhalers	[13]
Puducherry	Hospital-based	18% thought asthma contagious	58.9% embarrassed about diagnosis	52% 46.7% feared addiction to meds; 40% cited cost barrier	[18]
Ahmedabad (West India)	Hospital-based	Average knowledge of asthma	36.7% hesitant to disclose condition	60% did not maintain symptom charts; better compliance in severe asthma	[14]
Punjab (North India)	Hospital-based	44% believed asthma untreatable	-	-	[15]
Delhi	Hospital & community	53% believed asthma contagious; 50% unaware of diagnostics	-	16% used aerosol therapy; 42% preferred oral meds; two-thirds relied on home remedies	[16]
Andhra Pradesh	Hospital-based	60% hereditary cause, 1.43% contagious	-	Fears of harm (14.28%), immunity (30%), addiction (41.43%)	[17]
Rajasthan	Hospital-based	40% hereditary; 2% contagious	-	32% preferred oral meds; used emergency care during attacks	[8,24]
West Bengal	Hospital-based	-	-	91% concerned about side effects, 81.7% about addiction; inhaler + spacer use 40%	[22]
Jammu	Hospital-based	-	34% reluctant to acknowledge diagnosis	Only 9% sought medical help within 6 hours	[19]