

Original Research Article

KNOWLEDGE, ATTITUDE, AND PRACTICES REGARDING ALLERGIC RHINITIS AMONG PATIENTS VISITING AN ENT OUTPATIENT DEPARTMENT: A STUDY PROTOCOL

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ABSTRACT

Background: Allergic rhinitis is a highly prevalent chronic respiratory disorder that significantly impairs quality of life, yet patient awareness and self management often remain suboptimal. Assessing knowledge, attitude, and practices (KAP) is essential to design targeted educational interventions. The objective is to evaluate the knowledge, attitude, and practices concerning allergic rhinitis among patients attending the ENT outpatient department of a tertiary care teaching hospital in Delhi.

Materials and Methods: A cross sectional study was conducted from August 2024 to August 2025. Sixty adult patients with clinician diagnosed allergic rhinitis were enrolled by convenience sampling. A pre validated, semi structured questionnaire capturing demographics, knowledge (10 items), attitude (5 Likert statements), and practices (7 items) was administered after informed consent. Data were analysed using descriptive statistics, Chi square test, and logistic regression where appropriate.

Results: The mean age of participants was 34.2 ± 11.6 years; 53.3% were males. Only 21.6% demonstrated good overall knowledge, 41.7% had average, and 36.7% had poor knowledge. Substantial misconceptions were evident: 58.3% believed nasal sprays are addictive, and only 20% used intranasal corticosteroids regularly. Self medication with over the counter antihistamines was reported by 41.7%. Education level was significantly associated with knowledge score ($p < 0.001$).

Conclusion: Considerable gaps exist in knowledge and desirable practices among allergic rhinitis patients, despite moderate attitudes. Structured health education in the outpatient setting is urgently required to bridge these gaps and improve disease control.

Keywords: Allergic rhinitis, Knowledge, Attitude, Practices, KAP, ENT outpatient.

INTRODUCTION

Allergic rhinitis (AR) is an immunoglobulin E mediated inflammatory disorder of the nasal mucosa triggered by aeroallergens, clinically characterised by sneezing, rhinorrhoea, nasal congestion, and nasal itching.^[1,2] It is one of the most common chronic non communicable diseases globally, affecting between 10% and 40% of the population depending on geographic region and diagnostic criteria.^[3] The International Study of Asthma and Allergies in

Childhood (ISAAC) documented a steep rise in the prevalence of allergic rhinoconjunctivitis worldwide over the last three decades, and similar trends have been observed in Indian epidemiological surveys.^[4,5] In India, the prevalence of AR ranges from 11% to 26% in different studies, with urban areas consistently reporting higher rates attributable to increasing vehicular pollution, indoor allergens, and lifestyle changes.^[6,7] Despite this substantial burden, AR is frequently trivialised by patients and sometimes even by healthcare providers as a minor

nuisance rather than a condition requiring systematic long term management.

The morbidity associated with AR extends well beyond nasal symptoms. Untreated or poorly controlled AR leads to sleep disturbance, daytime fatigue, impaired cognitive function, and decreased productivity at work or school.^[8,9] Moreover, AR and asthma share a unified airway concept, with up to 40% of AR patients suffering from concomitant asthma and a similar proportion of asthmatics experiencing rhinitis symptoms.^[1,10] AR also predisposes to recurrent sinusitis, otitis media, and dental malocclusion in children.^[2] The economic impact is considerable, comprising direct medical costs and indirect costs from absenteeism and presenteeism.^[8] Therefore, effective management, built on patient education, allergen avoidance, pharmacotherapy, and where indicated, immunotherapy, is paramount.^[1]

Central to successful long term control is the patient's own understanding of the disease. The KAP (Knowledge, Attitude, and Practices) framework provides a structured approach to uncover gaps between what patients know, how they feel about their condition, and how they actually behave.^[11] Patients with poor knowledge may hold negative attitudes, such as fear of corticosteroid side effects or belief in the contagious nature of rhinitis, leading to inadequate treatment adherence and reliance on unproven home remedies. Several KAP studies from India and other low and middle income countries have consistently shown suboptimal awareness about triggers, the chronic nature of the disease, and the role of intranasal corticosteroids, while self medication with oral antihistamines remains rampant.^[12-15] However, regional variations exist, and the patient profile of a tertiary care public hospital in a metropolitan city like Delhi may differ markedly from that reported in community based or private hospital settings.

The Department of Otorhinolaryngology at the University College of Medical Sciences and Guru Teg Bahadur Hospital, a large public teaching hospital in East Delhi, serves a diverse population from urban slums, resettlement colonies, and adjoining rural areas. No prior KAP assessment focusing exclusively on patients visiting the ENT outpatient department with a confirmed diagnosis of AR has been conducted at this centre. Understanding the baseline knowledge and behavioural patterns of this cohort is a prerequisite for designing context specific, low cost educational interventions that can be integrated into routine clinical practice. The present study protocol, therefore, was conceived to systematically evaluate the knowledge, attitude, and practices regarding allergic rhinitis in this patient population over a one year period.

Objective

Primary objective: To assess the level of knowledge, the prevailing attitudes, and the self reported practices regarding allergic rhinitis among

adult patients attending the ENT outpatient department at a tertiary care hospital in Delhi.

Secondary objectives: To examine the association between sociodemographic variables (age, sex, education, residence, and duration of illness) and the overall knowledge score. Additionally, to identify the most prevalent misconceptions and harmful practices that could be targeted in a future interventional educational module. The study also aimed to rank the common sources from which patients obtain health information related to allergic rhinitis, thereby providing evidence for the most effective channels for health communication.

MATERIALS AND METHODS

Study design and setting: This was a hospital based, cross sectional, observational study carried out over a 12 month period from August 2024 to August 2025. The study site was the Outpatient Department of Otorhinolaryngology, University College of Medical Sciences (UCMS) and Guru Teg Bahadur (GTB) Hospital, Delhi, a 1,700 bed tertiary care teaching institution that caters predominantly to the socioeconomically disadvantaged population of East Delhi and neighbouring states.

Sample size and sampling: A convenience sample of 60 adult patients was enrolled. The sample size was guided by feasibility within the stipulated study period and the available manpower, consistent with similar exploratory KAP investigations.^[13,15] Every consecutive patient satisfying the eligibility criteria on two designated OPD days per week was invited to participate until the target number was reached.

Inclusion criteria

1. Age between 18 and 65 years.
2. Clinician confirmed diagnosis of allergic rhinitis according to the Allergic Rhinitis and its Impact on Asthma (ARIA) guidelines: presence of two or more nasal symptoms (sneezing, rhinorrhoea, nasal obstruction, itching) for at least one hour on most days during the symptomatic period.^[1]
3. Willingness to provide written informed consent.

Exclusion criteria

1. Patients with acute sinusitis, nasal polyposis, or gross anatomical nasal obstruction (e.g., deviated nasal septum requiring surgery) that could confound symptom reporting.
2. History of immunotherapy within the preceding 12 months.
3. Severe systemic illness, cognitive impairment, or psychiatric condition that precluded reliable completion of the questionnaire.
4. Inability to comprehend Hindi or English, the two languages of the study instrument.

Data collection procedure: After obtaining approval from the all-eligible patients were approached. The purpose and voluntary nature of the study were explained, and written informed consent was taken. A pre validated, structured questionnaire was administered by a trained research assistant through a

face to face interview to minimise missing data and to assist participants with low literacy. The questionnaire, developed after an extensive literature review,^[11-15] and validated by three ENT specialists and one public health expert, comprised four sections:

- **Section A Demographics:** Age, sex, educational level, occupation, residence (urban/rural), duration of allergic rhinitis symptoms, and family history.
- **Section B Knowledge:** Ten multiple choice/true false questions covering aetiology, triggers, symptoms, association with asthma, contagiousness, role of intranasal corticosteroids, side effects of antihistamines, curability, and utility of allergy testing. Each correct response scored 1 point, yielding a total knowledge score ranging from 0 to 10. Scores were subsequently categorised as poor (0–4), average (5–7), or good (8–10).
- **Section C Attitude:** Five statements on a three point Likert scale (agree, neutral, disagree), exploring perceived severity, fear of nasal spray addiction, necessity of regular follow up, preference for home remedies, and beliefs about pollution and stress as primary causes.
- **Section D Practices:** Seven items with binary (yes/no) or multiple choice responses, inquiring about use of over the counter antihistamines, regular use of prescribed intranasal corticosteroids, steam inhalation, allergen avoidance measures, self medication with

antibiotics, doctor consultation pattern, and treatment discontinuation. An additional question identified the main source of health information (doctor, internet, family/friends, television, others), the data from which were used to construct a pie chart.

Statistical data analysis: Data were entered in Microsoft Excel and analysed using IBM SPSS Statistics for Windows, version 25.0 (IBM Corp., Armonk, NY). Descriptive statistics were expressed as means $\pm$ standard deviation for continuous variables and as frequencies and percentages for categorical variables. The Chi square (χ^2) test was employed to assess the association between knowledge categories and sociodemographic variables. Fisher's exact test was used when expected cell frequencies were less than 5. A p value <0.05 was considered statistically significant. Tables and figures were generated to summarise the findings.

RESULTS

A total of 60 participants were enrolled, none of whom refused consent or dropped out. The sociodemographic profile is displayed in [Table 1]. The mean age was 34.2 ± 11.6 years, with a slight male predominance (53.3%). The majority had received secondary education (41.7%), and two thirds resided in urban areas. Half of the patients had been suffering from allergic rhinitis for 1–5 years.

Table 1: Demographic characteristics of study participants (N=60)

Variable	Category	Frequency (n)	Percentage (%)
Age (years)	18–30	22	36.7
	31–45	20	33.3
	46–60	14	23.3
	>60	4	6.7
Sex	Male	32	53.3
	Female	28	46.7
Education	Illiterate/Primary	15	25.0
	Secondary	25	41.7
	Graduate & above	20	33.3
Residence	Urban	40	66.7
	Rural	20	33.3
Duration of AR	<1 year	12	20.0
	1–5 years	30	50.0
	>5 years	18	30.0

The overall distribution of knowledge scores is presented as a bar chart [Figure 1]. The mean knowledge score was 5.2 ± 2.1 out of 10. Only 13 participants (21.6%) were classified as having good knowledge; 25 (41.7%) had average, and 22 (36.7%) had poor knowledge. The item wise correct response rates [Table 2] revealed striking patterns. While a large majority correctly identified common

symptoms (86.7%) and knew that allergic rhinitis is not contagious (83.3%), only 23.3% were aware that intranasal corticosteroids are safe for long term use, and a mere 20% correctly recognised that the disease cannot be permanently cured. The association between allergic rhinitis and asthma was known by just 30% of respondents.

Table 2: Item wise knowledge regarding allergic rhinitis (N=60)

Knowledge Item (Correct Response)	n (%) with correct answer
AR is caused by allergens (dust mites, pollen)	45 (75.0)
Common symptoms include sneezing, runny nose, blockage	52 (86.7)
AR can be associated with asthma	18 (30.0)

Avoidance of triggers helps in symptom control	32 (53.3)
AR is not a contagious disease	50 (83.3)
Intranasal corticosteroids are safe for long-term use	14 (23.3)
Antihistamines can cause drowsiness	38 (63.3)
AR cannot be cured permanently	12 (20.0)
Allergy testing helps identify triggers	28 (46.7)
Continuous treatment may be necessary	22 (36.7)

Attitude scores [Table 3] reflected significant ambivalence. Although 40% disagreed that allergic rhinitis is a minor health problem, 36.7% still considered it trivial. The most concerning finding was that 58.3% of patients believed nasal sprays are

addictive, and 30% considered home remedies superior to allopathic treatment. A large proportion (66.7%) attributed the cause primarily to stress and pollution rather than to specific aeroallergens.

Table 3: Attitude towards allergic rhinitis (N=60)

Statement	Agree n (%)	Neutral n (%)	Disagree n (%)
AR is a minor health problem	22 (36.7)	14 (23.3)	24 (40.0)
Nasal sprays are addictive	35 (58.3)	10 (16.7)	15 (25.0)
Regular follow-up is necessary	32 (53.3)	18 (30.0)	10 (16.7)
Home remedies are better than allopathic medicines	18 (30.0)	20 (33.3)	22 (36.7)
Stress and pollution are the main causes	40 (66.7)	12 (20.0)	8 (13.3)

Self reported practices [Table 4] corroborated the knowledge deficits. Nearly 42% used over the counter antihistamines, and only 20% adhered to regular intranasal corticosteroid therapy. Steam inhalation was the most common home remedy

(46.7%), whereas allergen avoidance measures were practised by only 30%. Encouragingly, 58.3% consulted a doctor whenever symptoms worsened, though 8.3% had never sought any medical help.

Table 4: Self reported practices related to allergic rhinitis (N=60)

Practice	n (%)
Over-the-counter antihistamine use	25 (41.7)
Regular use of prescribed intranasal corticosteroids	12 (20.0)
Steam inhalation for symptom relief	28 (46.7)
Active avoidance of dust/pollen	18 (30.0)
Self-medication with antibiotics	6 (10.0)
Doctor consultation on symptom worsening	35 (58.3)
Never sought any treatment	5 (8.3)

A pie chart [Figure 2] illustrates the sources of health information. Nearly half (45%) relied on healthcare providers, followed by the internet (25%). Family and friends accounted for 15%, television for 10%, and other sources for 5%.

Educational level was strongly associated with knowledge category [Table 5]. Among

illiterate/primary educated participants, 80% had poor knowledge and none reached the good category. In contrast, 50% of graduates and above demonstrated good knowledge. The Chi square test confirmed a highly significant association ($\chi^2=26.4$, $p<0.001$).

Table 5: Association between education level and knowledge category

Education Level	Poor Knowledge n (%)	Average Knowledge n (%)	Good Knowledge n (%)	Total
Illiterate/Primary	12 (80.0)	3 (20.0)	0 (0.0)	15
Secondary	8 (32.0)	14 (56.0)	3 (12.0)	25
Graduate & above	2 (10.0)	8 (40.0)	10 (50.0)	20
Total	22 (36.7)	25 (41.7)	13 (21.6)	60

$\chi^2=26.4$; $df=4$; $p<0.001$

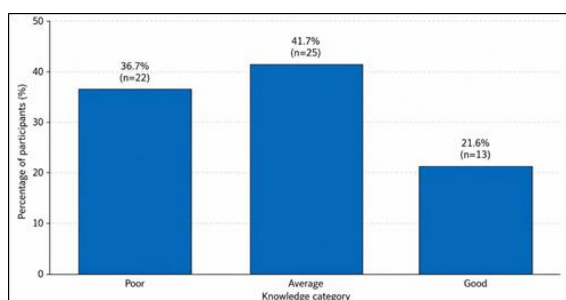


Figure 1: Distribution of overall knowledge categories among patients with allergic rhinitis

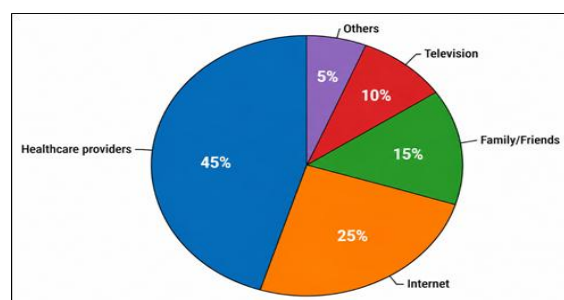


Figure 2: Sources of health information among patients with allergic rhinitis

DISCUSSION

The present cross sectional KAP survey conducted among 60 allergic rhinitis patients visiting a public tertiary care ENT OPD in Delhi reveals substantial lacunae in knowledge and suboptimal practices, despite a generally moderate attitude. The finding that only 21.6% of participants possessed good knowledge is consistent with previous Indian reports. Joseph et al,^[13] documented that among medical students—a group expected to have better health literacy—only 41% had adequate knowledge about allergic rhinitis; among patients, the figures are invariably lower. A community based study in Karnataka reported that 56% of adults were unaware of the allergic basis of their nasal symptoms,^[15] while in our cohort, 25% still did not attribute symptoms to allergens. These data underscore a pervasive lack of disease specific awareness that transcends geographic and socioeconomic boundaries.

The pattern of misconceptions is particularly instructive. The most alarming finding is that 58.3% of patients believed intranasal sprays are addictive, a fear deeply rooted in the confusion between corticosteroid sprays and decongestant sprays (rhinitis medicamentosa),^[16,17] This misconception has direct consequences: only 20% used their prescribed intranasal corticosteroid regularly, a cornerstone of AR management according to ARIA guidelines.^[1] Similar fears of “steroid phobia” have been reported in up to 70% of patients in some Indian studies,^[18] highlighting an urgent need for counselling that distinguishes between the safety profile of modern intranasal corticosteroids and older oral steroids or decongestant drops. The high rate of self medication with oral antihistamines (41.7%) that we observed is a double edged sword. While non sedating antihistamines are effective for mild intermittent AR, their unsupervised use may mask the need for controller therapy and delay appropriate medical consultation.^[19] Moreover, 10% of patients admitted to antibiotic self medication, a dangerous practice given the non infectious nature of the disease, fuelling antimicrobial resistance.

Attitudes were mixed. A slim majority (53.3%) agreed that regular follow up is necessary, yet 36.7% still considered AR a minor ailment, mirroring the trivialisation often noted in busy OPDs where patients present only when symptoms become unbearable.^[8,9] The pervasive attribution of symptoms to “stress and pollution” (66.7%) reflects the urban Delhi context, where air quality indices frequently dominate public discourse. While pollutants do exacerbate rhinitis,^[20] an exclusive emphasis on them can detract from the role of perennial indoor allergens (house dust mites, cockroach, fungi) that can be mitigated through behavioural change. Interestingly, 45% of our patients cited doctors as their primary source of health information, indicating that the OPD encounter remains a powerful teachable moment.

However, the quality of that information seems inadequate, as critical knowledge items (link with asthma, curability, safety of nasal sprays) remained poorly understood. This signals a gap in physician patient communication that could be bridged by incorporating simple, illustrated educational materials and a dedicated counselling step during the consultation.

The significant positive association between education and knowledge ($p < 0.001$) reinforces the well established role of health literacy in disease self management.^[21] Illiterate and primary school educated patients were virtually excluded from the good knowledge bracket. This gradient suggests that uniform, text heavy information leaflets are unlikely to be effective; instead, pictorial aids and verbal counselling in the local language should be prioritised. The duration of illness, surprisingly, was not associated with knowledge in our exploratory analysis, implying that patients do not “learn by experience” without structured education. This observation has been echoed in KAP studies on asthma and diabetes, where disease longevity alone does not correct misconceptions.^[22] Our results also resonate with a recent multicentric North Indian survey that reported analogous levels of non adherence to intranasal steroids (around 75%) and similar reliance on home remedies such as steam inhalation.^[23] The relatively low adoption of allergen avoidance measures (30%) may be partly due to the practical difficulties of environmental control in densely populated urban dwellings, but also reflects inadequate knowledge about specific triggers.

From a public health perspective, the findings advocate for a multi pronged strategy. First, training ENT residents and nurses to deliver a standardised, five minute structured education session during OPD visits could demystify intranasal steroids and correct the “addiction” myth. Second, leveraging the 25% of patients who use the internet for health information opens the possibility of sharing verified digital content via hospital branded social media handles or WhatsApp groups—a low cost, scalable intervention that has shown promise in chronic disease management.^[24] Third, since family and friends constitute a notable information source (15%), peer led educational models, perhaps involving well controlled “expert patients”, might be piloted. Our study, though modest in scope, provides baseline metrics against which such interventions can be evaluated.

Limitations of the Study: The present investigation carries several limitations that must be acknowledged. The sample size of 60, while adequate for an exploratory single centre KAP study, is modest and restricts the generalisability of the findings, particularly the subgroup analyses. Convenience sampling from a single tertiary care public hospital in East Delhi introduces selection bias; the results may not represent patients attending private clinics, primary health centres, or those who never seek hospital care. The cross sectional design captures a

snapshot in time and does not permit causal inference. The reliance on self reported practices, even with a face to face interview, is subject to social desirability and recall bias actual medication adherence, for instance, may be lower than reported. Furthermore, the questionnaire, although pre validated, has not been extensively tested for psychometric properties across diverse populations. The study could not incorporate objective measures of disease severity or allergen sensitisation, which might have enriched the analysis. Finally, the single centre nature and the specific urban rural mix of Delhi limit direct extrapolation to other Indian states, underscoring the need for larger, multicentric studies.

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CONCLUSION

This study demonstrates that among allergic rhinitis patients attending a tertiary public hospital in Delhi, knowledge about the disease is largely suboptimal, with critical deficits in understanding the chronic nature of the condition, the safety of intranasal corticosteroids, and the atopic connection with asthma. These knowledge gaps translate into harmful practices—widespread self medication with oral antihistamines, very low adherence to effective controller therapy, and a misplaced reliance on steam inhalation over evidence based pharmacotherapy. Educational status emerged as the single most powerful determinant of knowledge, implying that health communication strategies must be carefully tailored to varying literacy levels.

Addressing these shortcomings is both an individual clinical responsibility and a systemic necessity. Busy ENT outpatient departments must evolve from solely prescription oriented encounters to settings where brief, structured, and linguistically appropriate education is delivered as an integral component of care. Specific myths, especially corticosteroid phobia, need to be directly countered using relatable analogies and visual tools. Empowering patients with correct knowledge can transform the management of allergic rhinitis from an episodic crisis driven model to a planned, preventive, and participatory health paradigm, ultimately reducing the personal and societal burden of this ubiquitous yet neglected disorder.

REFERENCES

1. Bousquet J, Khaltaev N, Cruz AA, Denburg J, Fokkens WJ, Togias A, et al. Allergic Rhinitis and its Impact on Asthma (ARIA) 2008 update (in collaboration with the World Health Organization, GA(2)LEN and AllerGen). *Allergy*. 2008;63 Suppl 86:8-160.
2. Brożek JL, Bousquet J, Baena-Cagnani CE, Bonini S, Canonica GW, Casale TB, et al. Allergic Rhinitis and its Impact on Asthma (ARIA) guidelines: 2010 revision. *J Allergy Clin Immunol*. 2010;126(3):466-76.
3. Asher MI, Montefort S, Björkstén B, Lai CK, Strachan DP, Weiland SK, et al. Worldwide time trends in the prevalence of symptoms of asthma, allergic rhinoconjunctivitis, and eczema in childhood: ISAAC Phases One and Three repeat multicountry cross-sectional surveys. *Lancet*. 2006;368(9537):733-43.
4. Singh S, Sharma BB, Salvi S, Chhabra SK, Gupta SK, Joshi JM, et al. Allergic rhinitis, rhinoconjunctivitis, and eczema: Indian ISAAC study. *Indian J Pediatr*. 2016;83(3):220-5.
5. Aggarwal AN, Agarwal R, Dhooira S, Prasad KT, Sehgal IS, Muthu V, et al. Prevalence of allergic rhinitis and asthma in Indian adults: a cross-sectional study. *Int J Tuberc Lung Dis*. 2020;24(5):532-7.
6. Shah A, Pawar D. Allergic rhinitis and associated comorbidities: an Indian perspective. *Indian J Chest Dis Allied Sci*. 2013;55(3):155-62.
7. Varshney J, Varshney H. Allergic rhinitis: an overview. *Indian J Otolaryngol Head Neck Surg*. 2015;67(2):143-9.
8. Meltzer EO. Allergic rhinitis: burden of illness, quality of life, comorbidities, and control. *Immunol Allergy Clin North Am*. 2016;36(2):235-48.
9. Bhattacharya N. Incremental healthcare utilization and expenditures for allergic rhinitis in the United States. *Laryngoscope*. 2011;121(9):1830-3.
10. Bousquet J, Schünemann HJ, Togias A, Bachert C, Erhola M, Hellings PW, et al. Next-generation Allergic Rhinitis and Its Impact on Asthma (ARIA) guidelines for allergic rhinitis based on Grading of Recommendations Assessment, Development and Evaluation (GRADE) and real-world evidence. *J Allergy Clin Immunol*. 2020;145(1):70-80.e3.
11. Andrade C, Menon V, Praharaj SK, Ameen S. Designing and conducting knowledge, attitude, and practice surveys in psychiatry: practical guidance. *Indian J Psychol Med*. 2020;42(5):478-81.
12. Joseph N, Rasquinha R, Bhat S, Nelliyanil M, Kotian SM. Knowledge, attitude and practice towards allergic rhinitis among medical students in a tertiary care hospital. *Indian J Otolaryngol Head Neck Surg*. 2016;68(1):62-7.
13. Patil S, Kondwilkar B, Kulkarni S, Patil M. A cross-sectional study to assess knowledge, attitude and practice regarding allergic rhinitis among patients visiting ENT OPD. *J Clin Diagn Res*. 2018;12(6):MC01-MC04.
14. Murali A, Priyadarshini R, Kumar S. Knowledge, attitude and practices regarding allergic rhinitis among adult patients attending a tertiary care hospital in South India. *Int J Otorhinolaryngol Head Neck Surg*. 2019;5(4):897-902.
15. Rao S, Shetty S, D'Souza N, Kamath V. Knowledge, attitude and practices regarding allergic rhinitis among urban population in Karnataka. *Int J Community Med Public Health*. 2021;8(2):845-50.
16. Scadding GK. Corticosteroids in the treatment of allergic rhinitis. *J Allergy Clin Immunol*. 2001;108(1 Suppl):S59-64.
17. Naclerio RM, Hadley JA, Stoloff S, Nelson HS. Patient and physician perspectives on the attributes of intranasal corticosteroids. *Allergy Asthma Proc*. 2004;25(5):313-20.
18. Verma R, Mishra A, Roy S. Steroid phobia and adherence to intranasal corticosteroids in patients with allergic rhinitis in North India. *Indian J Allergy Asthma Immunol*. 2019;33(2):81-6.
19. Church MK, Church DS. Pharmacology of antihistamines. *Indian J Dermatol*. 2014;59(3):219-24.
20. D'Amato G, Cecchi L, Bonini S, Nunes C, Annesi-Maesano I, Behrendt H, et al. Allergenic pollen and pollen allergy in Europe. *Allergy*. 2007;62(9):976-90.
21. Berkman ND, Sheridan SL, Donahue KE, Halpern DJ, Crotty K. Low health literacy and health outcomes: an updated systematic review. *Ann Intern Med*. 2011;155(2):97-107.
22. Giraud V, Roche N. Misunderstanding of asthma controller medications: association with non-adherence. *J Asthma*. 2002;39(2):125-31.
23. Gupta N, Sharma A, Singh V, Kohli A. Knowledge, attitude and practices of patients with allergic rhinitis in a tertiary care centre in North India: a cross-sectional survey. *Indian J Otolaryngol Head Neck Surg*. 2022;74(Suppl 2):1528-35.
24. Free C, Phillips G, Galli L, Watson L, Felix L, Edwards P, et al. The effectiveness of mobile-health technology-based health behaviour change or disease management interventions for health care consumers: a systematic review. *PLoS Med*. 2013;10(1):e1001362.