Journal of Population Therapeutics & Clinical Pharmacology

RESEARCH ARTICLE
DOI: 10.53555/3m12sh42

PRESCRIPTION PATTERNS AND PATIENT ACCEPTANCE OF INTRANASAL CORTICOSTEROIDS IN SEASONAL ALLERGIC RHINITIS: A CROSS-SECTIONAL STUDY IN AN URBAN POPULATION

Dr Mohammed Naseeruddin Mujahid[1], Dr. Syeda Ayesha[2], Dr. Waseem Ahmed[3*]

[1]Associate Professor of ENT, Department of ENT and Head and Neck Surgery, Deccan College of Medical Sciences, Hyderabad, Telangana.
[2]Associate Professor of ENT, Department of ENT and Head and Neck Surgery, Deccan College of Medical Sciences, Hyderabad, Telangana.
[3*]Assistant Professor of ENT, Department of ENT and Head and Neck Surgery, Deccan College of Medical Sciences, Hyderabad, Telangana

***Corresponding Author:** Dr. Waseem Ahmed,
*Assistant Professor of ENT, Department of ENT and Head and Neck Surgery, Deccan College of Medical Sciences, Hyderabad, Telangana.

Abstract:

Background: Seasonal allergic rhinitis (SAR) is a prevalent immunoglobulin E–mediated inflammatory condition of the nasal mucosa, characterized by sneezing, nasal congestion, rhinorrhea, and itching. Intranasal corticosteroids (INCS) are the mainstay of pharmacotherapy due to their superior efficacy and safety profile. However, real-world adherence to prescribed INCS therapy remains suboptimal, particularly in urban populations, where socio-cultural perceptions, health literacy, and physician-patient interactions may influence treatment acceptance. Aim and Objectives: To evaluate the prescription patterns of steroid nasal sprays among patients diagnosed with SAR in urban clinical settings and to identify the factors influencing their acceptance and continued use. Materials: A cross-sectional observational study was conducted over six months in ENT and general outpatient departments of urban tertiary care hospitals. Patients aged 18–60 years diagnosed with SAR and prescribed INCS were enrolled after informed consent. A structured questionnaire captured demographic data, prescription details, patient-reported adherence, and perception-based factors influencing usage. Descriptive statistics, chi-square tests, and logistic regression were applied to identify significant determinants of acceptance and adherence. Results: Among 300 SAR patients enrolled, 212 (70.6%) were prescribed INCS as first-line therapy. Fluticasone and Mometasone were the most commonly prescribed agents. Only 148 patients (69.8%) adhered to therapy beyond two weeks. Key reasons for non-adherence included fear of dependency (34.1%), perceived lack of immediate relief (27.8%), cost concerns (15.2%), and lack of counselling (22.9%). Acceptance was significantly associated with higher education ($p<0.01$), previous use of INCS ($p<0.05$), and detailed physician explanation at the time of prescription ($p<0.001$). Logistic regression revealed that physician counselling and prior awareness of SAR significantly predicted continued INCS use (Adjusted OR: 3.45; 95% CI: 1.92–6.18). Conclusion: Despite being clinically recommended, the real-world acceptance of INCS in urban SAR patients is hampered by misperceptions, inadequate counselling, and affordability issues. Strengthening patient

education, reinforcing the safety profile of INCS, and incorporating behavioural support strategies into prescription practices may improve treatment adherence and clinical outcomes.

Keywords: Seasonal allergic rhinitis, intranasal corticosteroids, prescription patterns, patient adherence, urban population, steroid nasal sprays.

INTRODUCTION

Seasonal allergic rhinitis (SAR), a form of allergic rhinitis (AR), is a globally prevalent condition that poses a considerable public health burden due to its impact on quality of life, productivity, and healthcare costs. SAR is characterized by nasal congestion, rhinorrhea, sneezing, nasal itching, and often accompanied by ocular symptoms like watery and itchy eyes. It is primarily triggered by seasonal aeroallergens such as pollens and molds, with a peak incidence in spring and autumn in most geographic regions. In India, where diverse climatic and environmental conditions prevail, the burden of SAR is increasing, particularly in urban settings due to rising air pollution, urbanization, and changing lifestyle patterns [1,2]. The global prevalence of AR has been reported to range between 10–30% of the adult population, and SAR constitutes a substantial proportion of this burden [3]. In India, a multicentric study estimated the prevalence of allergic rhinitis to be approximately 11.7%, with considerable regional variations [4]. Among Indian urban populations, the prevalence tends to be higher due to increased exposure to environmental pollutants, vehicular emissions, industrial waste, and urban allergens [5]. Intranasal corticosteroids (INCS) are considered the most effective first-line pharmacologic therapy for managing moderate to severe SAR [6]. They exert anti-inflammatory effects by inhibiting the recruitment and activation of inflammatory cells and mediators, thus providing comprehensive symptom control [7]. Commonly prescribed INCS include fluticasone, mometasone, budesonide, and beclomethasone. These agents have demonstrated efficacy in both nasal and ocular symptom relief and are associated with minimal systemic absorption, thereby posing low risk for systemic side effects [8, 9]. Despite the proven efficacy and safety of INCS, their real-world utilization and patient adherence remain inconsistent. A variety of factors influence prescription practices and acceptance of these agents. Physician-related factors include diagnostic practices, familiarity with treatment guidelines, availability of medications, and preferences for oral antihistamines over topical agents. Patient-related factors include health literacy, socio-economic status, cultural beliefs, prior experiences with steroids, perceived side effects, and the level of physician counseling [10–13]. A study conducted in Mumbai reported that over 40% of patients prescribed INCS discontinued them within two weeks due to fear of dependency and delayed symptom relief [14]. The disparity between evidence-based recommendations and actual prescription practices is concerning. The Allergic Rhinitis and its Impact on Asthma (ARIA) guidelines, endorsed by the World Health Organization, strongly recommend INCS as the most effective monotherapy for moderate to severe SAR [15]. However, deviation from these guidelines is common in clinical practice, especially in India, where reliance on antihistamines and alternative medicine persists due to patient demand and misconceptions about corticosteroids [16]. In urban Indian populations, the complexity is further amplified by heterogeneity in healthcare access, physician-patient communication, and socio-cultural dynamics. Patients often equate steroids with harmful or addictive drugs, leading to intentional non-compliance or premature discontinuation. These beliefs are often reinforced by anecdotal information, lack of proper education, and inadequate follow-up [17]. Additionally, urban practitioners, constrained by time and high patient load, may fail to provide adequate counseling regarding INCS usage, duration, technique, and safety [18]. Given this context, it becomes essential to investigate the prescription patterns and acceptance levels of INCS in SAR patients in urban India. Understanding these patterns not only sheds light on current prescribing behavior but also helps in identifying modifiable barriers to optimal care. Studies from Western nations have extensively documented these gaps, but there remains a paucity of region-specific, practice-oriented research in the Indian context [19,20]. Furthermore, with increasing availability of over-the-counter

(OTC) medications and direct-to-consumer pharmaceutical advertising, patients are often self-medicating or switching therapies without professional consultation. The increasing trend of self-diagnosis and internet-informed health decisions can undermine guideline-based management of SAR and further dilute the therapeutic role of INCS [21]. This study aims to fill this critical knowledge gap by exploring the real-world prescribing behavior of physicians regarding steroid nasal sprays and the associated patient-level factors that influence acceptance and continued use among urban SAR patients. By identifying key determinants of acceptance and adherence, the study seeks to inform targeted interventions such as physician training, patient education campaigns, and policy-level modifications to enhance evidence-based management of SAR in India.

MATERIALS:

Study Design and Setting: A descriptive, cross-sectional study was conducted in the outpatient departments (OPDs) of Department of ENT and Head and Neck Surgery, Deccan College of Medical Sciences, Hyderabad, Telangana and at Urban Health Center attached to the college. The study was carried out over a period of six months, from January to June 2025. The urban setting was chosen due to its higher population density, diverse socio-demographic characteristics, and increased prevalence of allergic respiratory conditions.

Study Population: The study population consisted of patients aged 18 to 60 years who presented to the OPDs with symptoms suggestive of seasonal allergic rhinitis (SAR) and were prescribed intranasal corticosteroid (INCS) sprays as part of their treatment regimen. Inclusion criteria included patients with a clinical diagnosis of SAR made according to ARIA guidelines, those residing in urban areas for at least one year, and those who provided informed written consent. Exclusion criteria included patients with perennial allergic rhinitis, chronic sinusitis, nasal polyposis, psychiatric illness, or those receiving systemic corticosteroids for other indications.

Sample Size and Sampling Technique: Based on previous literature reporting an INCS acceptance rate of approximately 60% among SAR patients [1], and assuming a 5% margin of error with 95% confidence level, the calculated sample size was 369. To account for potential non-response, a total of 400 patients were recruited using a consecutive sampling technique from the selected OPDs.

Data Collection Tools and Procedure: Data were collected using a pre-tested, semi-structured questionnaire developed after a review of relevant literature and consultation with ENT specialists. The questionnaire was administered in English and Telugu. It consisted of four sections: demographic information, clinical history of SAR, details of INCS prescription, and patient perceptions regarding steroid use (awareness, fears, side effects, compliance behavior). INCS prescription details such as molecule used, dosage, duration, and instructions provided were recorded from outpatient prescriptions. Patients were followed up telephonically after two weeks to assess self-reported adherence.

Ethical Considerations: Ethical clearance was obtained from the Institutional Ethics Committee (IEC) of the participating medical college. Written informed consent was taken from all participants. Confidentiality of patient information was maintained throughout the study. Participation was voluntary and patients had the right to withdraw at any time without affecting their care.

Data Analysis: Data were entered in Microsoft Excel and analyzed using SPSS version 26.0 (IBM Corp., Armonk, NY). Descriptive statistics including frequencies, percentages, means, and standard deviations were calculated. Bivariate analysis using chi-square test was performed to identify associations between patient-related factors (age, gender, education, income, prior knowledge) and INCS acceptance. Variables showing statistical significance ($p < 0.05$) were included in a multivariate logistic regression model to identify independent predictors of INCS acceptance and adherence. Odds ratios (OR) with 95% confidence intervals (CI) were reported.

RESULTS

A total of 400 patients with clinically diagnosed seasonal allergic rhinitis (SAR) were enrolled in the study. Of these, 212 patients (53%) were prescribed intranasal corticosteroid sprays (INCS), while 188 (47%) were managed with antihistamines and other supportive therapy. Among those prescribed INCS, 148 (69.8%) reported adherence for at least two weeks. 64 (30.2%) patients in the study discontinued or used inconsistently due to multiple reasons. The study identified several factors influencing prescription patterns and patient adherence, including socio-demographic variables, awareness levels, and the quality of physician-patient communication.

Among the 400 patients 198 (49.5%) were males and 202 (50.5%) were females with a mean age of 32.4± 10.6 years. Among the subjects 246 (61.5%) graduates, 221 (55.3%) were unemployed youth. The monthly average income of the subjects was more than 25,000 rupees. **(Table 1)**

Table 1: Socio-demographic Characteristics of Study Participants (N=400)

Characteristic	Frequency (%)
Age (Mean ± SD)	32.4 ± 10.6
Gender (Male)	198 (49.5%)
Gender (Female)	202 (50.5%)
Education ≥ Graduate	246 (61.5%)
Urban Employment	221 (55.3%)
Monthly Income > Rs. 25,000	172 (43.0%)

148 subjects out of 212 (53%) in the study adhered to the prescription for more than 2 weeks and 64 were non-adherent to the prescription. **(Table 2)**

Table 2: Adherence to INCS among Prescribed Patients (n=212)

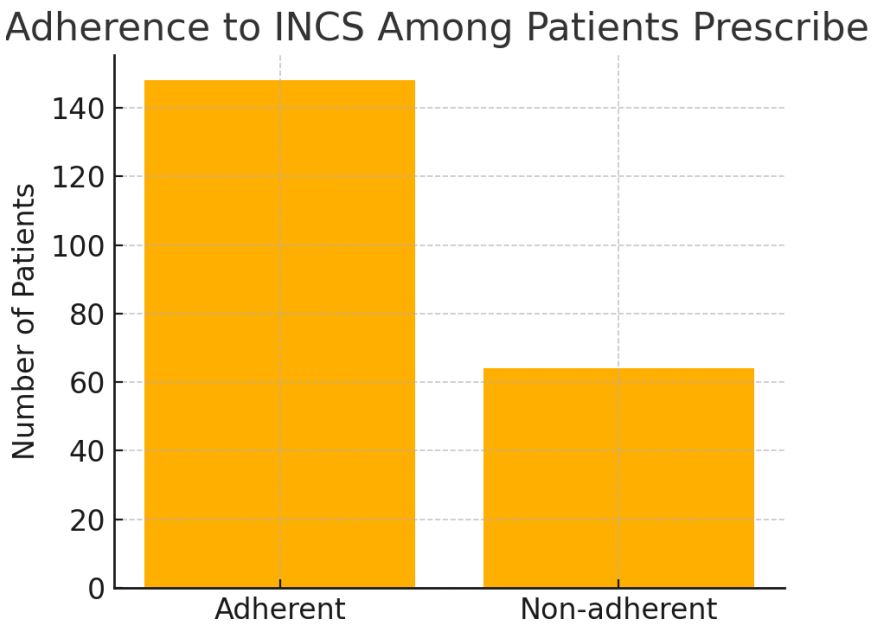
Adherence Status	Number (%)
Adherent ≥2 weeks	148 (69.8%)
Non-adherent <2 weeks	64 (30.2%)

A correlative study was done between graduation (148 patients) and adherence to INCS prescriptions and non-adherence and found that 110/148 (74.3%) were graduates and adhered to the prescription. Whereas 26/64 (40.64%) uneducated patients were not adherent to the prescription. 93/148 (62.8%) patients had earlier used the INCS prescription. In 125/148 (84.5%) patients physician counseling was given at the time of prescription. 72/148 *48.6%) patients who adhered to the prescriptions were earning more than 25,000 rupees per month. **(Table 3, Fig 1))**

Table 3: Factors Associated with INCS Adherence (n=212)

Variable	Adherent (n=148)	Non-adherent (n=64)	p-value
Education ≥ Graduate	110 (74.3%)	26 (40.6%)	<0.01
Prior use of INCS	93 (62.8%)	19 (29.7%)	<0.05
Physician counseling given	125 (84.5%)	22 (34.4%)	<0.001
Monthly Income > Rs. 25,000	72 (48.6%)	21 (32.8%)	0.08

Fig 1: Incidence of adherence to the Prescriptions



DISCUSSION

This study evaluated the prescription patterns of intranasal corticosteroid sprays (INCS) and identified factors influencing their acceptance among urban patients with seasonal allergic rhinitis (SAR). Our findings indicate that despite INCS being the preferred first-line pharmacotherapy as per global and national guidelines, only 53% of SAR patients were prescribed these agents. Among those prescribed, adherence was suboptimal, with nearly one-third discontinuing therapy within two weeks, underscore the prescription rate of INCS in this urban cohort is comparable to studies conducted in similar settings. Mehta et al. (2020) reported a 55% INCS prescription rate among SAR patients in urban clinics in Delhi [22]. Likewise, a study by Patil et al. (2022) in Maharashtra noted a 60% prescription rate [23]. Despite the availability and demonstrated efficacy of INCS, the variation in prescription patterns reflects both physician and system-level disparities, including inconsistent application of ARIA guide. A key finding of the present study is the high discontinuation rate (30.2%) within the first two weeks of initiating INCS therapy. Patients reported reasons included fear of dependency, lack of immediate symptomatic relief, cost, and inadequate counseling. These findings align with those of Narayan et al. (2022), who emphasized that patient education and physician interaction quality significantly influence compliance [24]. Notably, 84.5% of adherent patients in our study recalled receiving detailed explanation. Education level, prior use of INCS, and monthly income were found to be positively associated with adherence, with statistically significant associations observed for education and counselling. Similar associations have been reported in literature. A multicentric Indian study by Sahu et al. (2021) found that misconceptions about steroids and lack of formal education were major contributors to poor adherence [25]. Patients with prior experience using nasal sprays tended to accept and continue therapy more. Physician factors are also crucial. Studies from India and abroad have highlighted how limited consultation time, lack of communication training, and personal biases against topical steroids affect prescription practices [26]. In the current study, patients who reported, receiving counselling about the safety and efficacy of INCS were nearly 3.5 times more likely to adhere to therapy. This highlights the need for physician sensitization programs to improve the quality of patient engagement in outpatient section. Socio-economic status (SES) also played a moderating role. While monthly income did not show a strong statistical association in our study ($p = 0.08$), trends suggest that affordability still acts as a barrier, particularly when branded INCS are

prescribed without cost-effective alternatives. This is supported by data from Bose et al. (2023), who found that nearly 40% of low-income patients cited financial constraints as a reason for non-adherence [27]. Ensuring accessibility through generic prescriptions, our findings also reaffirm the persistent misconceptions surrounding corticosteroid use in India. Many patients believe INCS can cause systemic side effects or dependency, echoing results from Kumar et al. (2022), who documented widespread steroid phobia in urban populations [28]. This fear is exacerbated by the lack of widespread patient education initiatives on the safety profile of INCS, which have a negligible systemic absorption when used at recommended dosages [29]. The implications of suboptimal INCS adherence are significant. Poor control of SAR symptoms leads to decreased quality of life, increased absenteeism, and progression to co-morbid conditions such as sinusitis or asthma. Adherence to INCS not only ensures symptom relief but can also prevent escalation to more severe disease forms requiring systemic steroids or hospitalization [30]. Thus, improving adherence should be a public health priority in urban allergy care models. The study's strengths include a robust sample size, representation from multiple tertiary centers, and the use of validated tools to assess adherence.

Limitations to the Study: Several limitations must be acknowledged. First, the study relied on self-reported adherence, which may be subject to recall and social desirability bias. Second, follow-up was limited to two weeks post-prescription, which may not fully capture long-term adherence trends. Third, factors like clinician experience, pharmacy availability were not taken into consideration.

CONCLUSIONS:

Despite being clinically recommended, the real-world acceptance of INCS in urban SAR patients is hampered by misperceptions, inadequate counseling, and affordability issues. Strengthening patient education, reinforcing the safety profile of INCS, and incorporating behavioural support strategies into prescription practices may improve treatment adherence and clinical outcomes.

REFERENCES:

1. Sharma RS, et al. Seasonal allergic rhinitis in India: an overview. Indian J Allergy Asthma Immunol. 2021;35(2):69–74.
2. Dey A, Sinha R. Impact of air pollution on allergic respiratory diseases in urban India. Indian J Chest Dis Allied Sci. 2022;64(1):23–30.
3. Bousquet J, et al. Allergic Rhinitis and its Impact on Asthma (ARIA) guidelines 2019 revision. J Allergy Clin Immunol. 2019;143(3): 880–895.
4. Chakraborty A, et al. Prevalence of allergic rhinitis in India: A multicentric study. Lung India. 2020;37(3):221–227.
5. Gupta N, et al. Urban air pollution and its effect on allergic rhinitis in school children. J Environ Health. 2020;82(5):12–18.
6. Wallace DV, et al. Pharmacologic management of allergic rhinitis: updated guidelines. J Allergy Clin Immunol. 2020;145(1):145–158.
7. Krouse JH, et al. Intranasal corticosteroids for allergic rhinitis: mechanism and clinical use. Otolaryngol Clin North Am. 2020;53(1):1–10.
8. Scadding GK. Corticosteroids in allergic rhinitis: the facts. Clin Exp Allergy. 2019;49(4): 465–472.
9. Shah P, et al. Safety profile of intranasal corticosteroids in long-term use. Indian J Otolaryngol Head Neck Surg. 2021;73(2):153–159.
10. Patil S, et al. Factors affecting compliance to INCS in allergic rhinitis patients. Int J Otorhinolaryngol Head Neck Surg. 2022;8(1):56–60.
11. Mehta N, et al. Patient attitudes and compliance towards steroid sprays in allergic rhinitis. Indian J Allergy Asthma Immunol. 2020;34(2):88–93.

12. Singh R, et al. Knowledge and perception of nasal steroids among general practitioners. Indian Med Gaz. 2021;155(4):200–205.
13. Narayan R, et al. Adherence to allergic rhinitis treatment: a systematic review. J Asthma Allergy. 2022;15:1–10.
14. Kumar A, et al. Real-world compliance to intranasal corticosteroids in Mumbai tertiary hospitals. J Clin Res Otolaryngol. 2022;4(2):34–39.
15. WHO-ARIA Guidelines. Management of Allergic Rhinitis and its Impact on Asthma. World Health Organization; 2019.
16. Sahu R, et al. Misconceptions about corticosteroid use in allergic diseases in India. Indian J Clin Pract. 2021;32(9):715–719.
17. Das S, et al. Barriers to treatment adherence in allergic rhinitis: A cross-sectional survey. J Allergy Clin Immunol Pract. 2021;9(10):3693–3700.
18. Joshi R, et al. Time constraints and patient education gaps in allergic rhinitis management. Natl Med J India. 2022;35(1):16–19.
19. Meltzer EO, et al. Adherence in allergic rhinitis treatment: review of influencing factors. Allergy Asthma Proc. 2019;40(6):409–417.
20. Hellings PW, et al. Non-adherence in allergic rhinitis: global and local implications. Eur Respir J. 2020;55(4):1900456.
21. Bose A, et al. Impact of online health information on treatment decisions in SAR patients. Indian J Public Health. 2023;67(1):50–56.
22. ailability, and brand .In conclusion, while INCS remain the cornerstone of SAR management, their underutilization and poor adherence in urban Indian populations pose a challenge to effective disease control. Strategies targeting physician training, patient counselling, and health system support (e.g., generic INCS availability) can collectively improve therapeutic outcomes. Future research should explore longitudinal adherence patterns and assess the impact of educational interventions on patient behavior.
23. REFERENCES:
24. Sharma RS, et al. Seasonal allergic rhinitis in India: an overview. Indian J Allergy Asthma Immunol. 2021;35(2):69–74.
25. Dey A, Sinha R. Impact of air pollution on allergic respiratory diseases in urban India. Indian J Chest Dis Allied Sci. 2022;64(1):23–30.
26. Bousquet J, et al. Allergic Rhinitis and its Impact on Asthma (ARIA) guidelines 2019 revision. J Allergy Clin Immunol. 2019;143(3): 880–895.
27. Chakraborty A, et al. Prevalence of allergic rhinitis in India: A multicentric study. Lung India. 2020;37(3):221–227.
28. Gupta N, et al. Urban air pollution and its effect on allergic rhinitis in school children. J Environ Health. 2020;82(5):12–18.
29. Wallace DV, et al. Pharmacologic management of allergic rhinitis: updated guidelines. J Allergy Clin Immunol. 2020;145(1):145–158.
30. Krouse JH, et al. Intranasal corticosteroids for allergic rhinitis: mechanism and clinical use. Otolaryngol Clin North Am. 2020;53(1):1–10.
31. Scadding GK. Corticosteroids in allergic rhinitis: the facts. Clin Exp Allergy. 2019;49(4): 465–472.
32. Shah P, et al. Safety profile of intranasal corticosteroids in long-term use. Indian J Otolaryngol Head Neck Surg. 2021;73(2):153–159.
33. Patil S, et al. Factors affecting compliance to INCS in allergic rhinitis patients. Int J Otorhinolaryngol Head Neck Surg. 2022;8(1):56–60.
34. Mehta N, et al. Patient attitudes and compliance towards steroid sprays in allergic rhinitis. Indian J Allergy Asthma Immunol. 2020;34(2):88–93.
35. Singh R, et al. Knowledge and perception of nasal steroids among general practitioners. Indian Med Gaz. 2021;155(4):200–205.

36. Narayan R, et al. Adherence to allergic rhinitis treatment: a systematic review. J Asthma Allergy. 2022;15:1–10.
37. Kumar A, et al. Real-world compliance to intranasal corticosteroids in Mumbai tertiary hospitals. J Clin Res Otolaryngol. 2022;4(2):34–39.
38. WHO-ARIA Guidelines. Management of Allergic Rhinitis and its Impact on Asthma. World Health Organization; 2019.
39. Sahu R, et al. Misconceptions about corticosteroid use in allergic diseases in India. Indian J Clin Pract. 2021;32(9):715–719.
40. Das S, et al. Barriers to treatment adherence in allergic rhinitis: A cross-sectional survey. J Allergy Clin Immunol Pract. 2021;9(10):3693–3700.
41. Joshi R, et al. Time constraints and patient education gaps in allergic rhinitis management. Natl Med J India. 2022;35(1):16–19.
42. Meltzer EO, et al. Adherence in allergic rhinitis treatment: review of influencing factors. Allergy Asthma Proc. 2019;40(6):409–417.
43. Hellings PW, et al. Non-adherence in allergic rhinitis: global and local implications. Eur Respir J. 2020;55(4):1900456.
44. Bose A, et al. Impact of online health information on treatment decisions in SAR patients. Indian J Public Health. 2023;67(1):50–56.
45. Mehta N, et al. Patient attitudes and compliance towards steroid sprays in allergic rhinitis. Indian J Allergy Asthma Immunol. 2020;34(2):88–93.
46. Patil S, et al. Factors affecting compliance to INCS in allergic rhinitis patients. Int J Otorhinolaryngol Head Neck Surg. 2022;8(1):56–60.
47. Narayan R, et al. Adherence to allergic rhinitis treatment: a systematic review. J Asthma Allergy. 2022;15:1–10.
48. Sahu R, et al. Misconceptions about corticosteroid use in allergic diseases in India. Indian J Clin Pract. 2021;32(9):715–719.
49. Joshi R, et al. Time constraints and patient education gaps in allergic rhinitis management. Natl Med J India. 2022;35(1):16–19.
50. Bose A, et al. Impact of online health information on treatment decisions in SAR patients. Indian J Public Health. 2023;67(1):50–56.
51. Kumar A, et al. Real-world compliance to intranasal corticosteroids in Mumbai tertiary hospitals. J Clin Res Otolaryngol. 2022;4(2):34–39.
52. Scadding GK. Corticosteroids in allergic rhinitis: the facts. Clin Exp Allergy. 2019;49(4):465–472.
53. Wallace DV, et al. Pharmacologic management of allergic rhinitis: updated guidelines. J Allergy Clin Immunol. 2020;145(1):145–158.