

# Improving primary care management and referral practices for paediatric allergic rhinitis: A quality improvement study

Mounavi Vemula, Vishal Kapoor, Peter Bourke

## Background and objective

Paediatric allergic rhinitis (AR) is often referred for specialist input despite effective primary care strategies. This study evaluates AR referrals to the Cairns Hospital Paediatric Allergy Clinic against local guidelines and assesses the impact of a quality improvement project on referral patterns.

## Methods

A 12-month retrospective audit reviewed paediatric AR referrals and management. Interventions included updated guidelines, educational initiatives, and a streamlined referral process. Post-intervention referrals were analysed to assess impact on community management.

## Results

Pre-intervention, 10% (40/417) of referrals received were for AR, with 68% (27/40) discharged after primary management optimisation and only 20% (8/40) commencing allergen immunotherapy. Post-intervention, 22% (32/144) of referrals received were for AR, with 81% (26/32) on guideline recommended medical therapy at referral (vs 53% [21/40] pre-intervention,  $P = 0.01$ ) and 50% of these (16/32) had specified the treatment duration (vs 23% [9/40] pre-intervention,  $P = 0.02$ ).

## Discussion

Our streamlined referral process with referrer-focused educational initiatives, improved referral appropriateness and enhanced pre-hospital management of AR before specialist referral.

**PAEDIATRIC ALLERGIC RHINITIS (AR)**, commonly referred to as 'hayfever', affects up to 15% of the population.<sup>1</sup> The condition is often managed symptomatically by general practitioners (GPs), though referrals for specialist input are common because of its impact on quality of life and frequent association with comorbidities such as conjunctivitis, asthma, atopic dermatitis and adenoid hyperplasia.<sup>1-4</sup> Rising allergy prevalence has increased demand for allergy and immunology services, outpacing supply and creating significant bottlenecks with wait times of up to 2 years and placing strain on already stretched outpatient services.<sup>5-7</sup> Poor symptom control can impair school productivity, sleep, behaviour and mental health.<sup>8,9</sup>

To address capacity pressures, several Australian hospitals have implemented referral optimisation strategies, including regional HealthPathways, specialist advice portals, and expanded telehealth use across Queensland Health.<sup>10</sup> Allied health integration in two regional hospitals has reduced outpatient wait times, specialist demand, and diagnostic delays.<sup>11,12</sup> A randomised controlled trial by Sheikh et al showed structured allergy training for GPs improved outcomes for patients with AR, while Levy et al reported that a primary care-based allergy clinic reduced secondary referrals.<sup>13,14</sup>

Momentum is growing to upskill Australian GPs, particularly in underserved regions.<sup>5,15</sup> The Shared Care for Allergy Project recognised the pivotal role of GPs in frontline allergy care, including performing allergy assessments, prescription of first-line therapies and facilitating appropriate specialist referrals.<sup>5</sup> Initiatives led by the National Allergy Council and Australasian Society of Clinical Immunology and Allergy have subsequently supported GP education through online training modules and development of the Associateship of Clinical Allergy program.<sup>5,16</sup>

In April 2023, Cairns Hospital Paediatric Allergy and Immunology Clinic (PAIC) launched a quality improvement initiative to address rising referral volumes and prolonged wait times. Referrals were appraised against Queensland Health Clinical Prioritisation Criteria (CPC) and Far North Queensland Health Pathways (FNQ-HP) local guidelines, which recommend referral to specialist services for consideration of allergen immunotherapy (AIT) only after failure to respond to 'maximal medical management', defined as an 8-week trial of intranasal corticosteroids (INCS).<sup>17,18</sup>

This study evaluated the effectiveness of a streamlined referral process and targeted suite of interventions in enhancing the community-based management of AR before specialist referral.

## Methods

The study used the 'SQUIRE guidelines' quality improvement framework.<sup>19</sup> Initially, a pre-intervention audit assessed AR referrals and management against CPC and FNQ-HP guidelines. Following this, a multi-step intervention was developed with members of PAIC (Director of Allergy/Immunology department, specialist paediatric care providers and author) and the GP Hospital Liaison Unit. The intervention aimed to enhance education for referrers and patients with a re-audit conducted to evaluate its effectiveness against predefined standards. The study was conducted at Cairns Hospital, which serves as the primary referral hospital for Far North Queensland, covering over 142,900 square kilometres and serving a diverse population, including many Aboriginal and Torres Strait Islander peoples.

In March 2023, a retrospective audit was conducted to evaluate the referral details and outpatient management of individuals with AR at the PAIC over the previous 12 months. The study included patients under the age of 16 years who were attending their first appointment at the clinic, with referrals received from either paediatric doctors (in-hospital or private practice) or GPs. The study excluded patients undergoing treatment for AR alongside other comorbid allergic conditions that often required specialist input such as food allergy and/or eczema. Data collection and demographic criteria assessed are detailed in Appendix 1 (available online only). Referral information was provided by Cairns Hospital Performance Intelligence Analyst team. Data was collected from electronic medical records by MV then compiled in Excel.

In May 2023, a multicomponent intervention was launched comprising of:

- Updating the FNQ-HP website on 'Allergic Rhinitis'**, to provide a clearer summary of referral indications and cost considerations for AIT (<https://fnq.communityhealthpathways.org/welcome>). Website analytics were used to track visitor engagement.
- Streamlining the referral process:** Referrals not meeting the CPC and FNQ-HP criteria were declined by head of department, with explanatory letters sent to the referrer and patient's carer (Appendix 2; available online only).

Follow-up phone calls were made 4–6 months later to check progress in community.

- Publication of feature article** in the FNQ Clinical Update newsletter to inform GPs and hospital staff about the new referral process and highlighting primary management strategies.

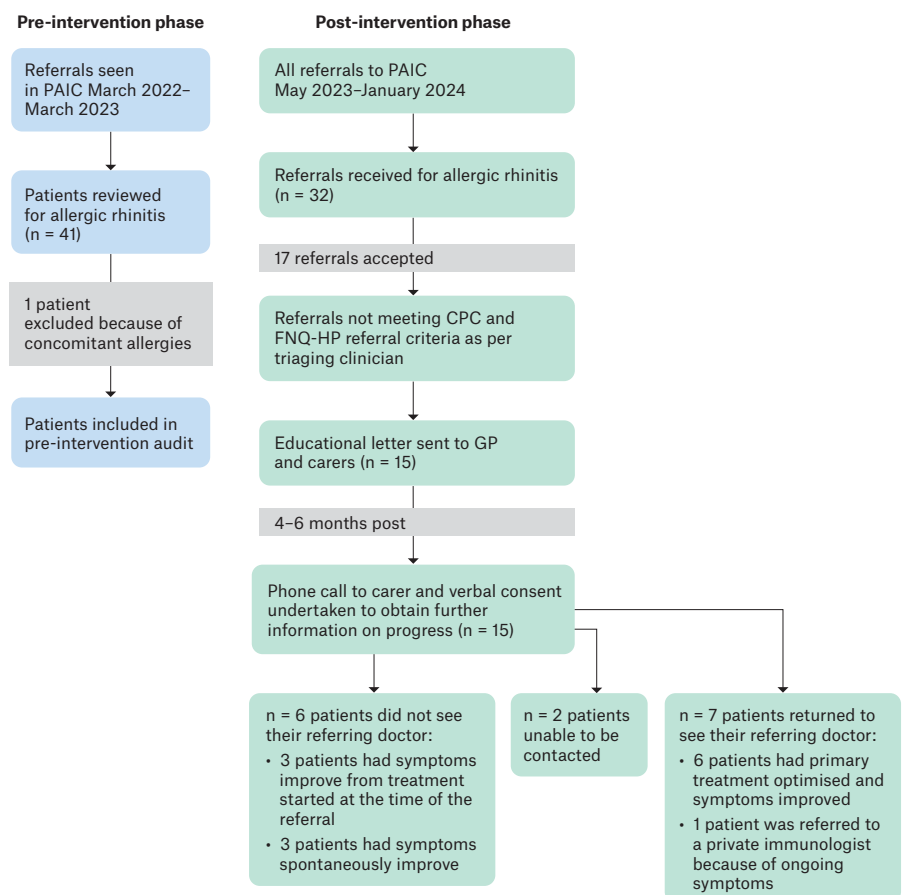
A re-audit was conducted from May 2023 to January 2024 collecting the same clinical data as in the initial audit. Categorical variables including age, sex, and clinical data were summarised using proportions and compared using Fisher's exact test. Continuous variables including age were compared using the Wilcoxon rank sum test ( $P < 0.05$  considered statistically significant). IBM SPSS Statistics

for Macintosh, Version 28.0 was used for analysis.

This quality improvement project was granted ethics exemption by the Far North Queensland Human Research Ethics Committee (Reference EX/2023/QCH/97136AprVer2-1714QA).

## Results

In the pre-intervention audit, 10% (41/417) of referrals received were for AR between March 2022 and March 2023 which were analysed (Figure 1). One patient was excluded because of concurrent management of food allergies. In the post-intervention period, 22% (32/144) of referrals received by



**Figure 1.** Flowchart of pre-intervention phase process and of streamlined referral and educational interventions in the post-intervention phase.

CPC, Clinical Prioritisation Criteria; FNQ-HP, Far North Queensland-Health Pathways; GP, general practitioner; PAIC, Paediatric Allergy and Immunology Clinic.

the PAIC were for management of AR alone (Figure 1). The baseline characteristics of the two groups are outlined in Table 1.

**Allergic rhinitis management**

Management outcomes for AR in the pre-intervention group were evaluated. AIT was initiated within the first or second

clinic appointment for 20% (8/40) of patients. A total of 68% (27/40) of patients were discharged from PAIC after optimising primary management through non-sedating antihistamines (NSA) and INCS. Approximately half of these patients were discharged within the first consultation alone. A total of 13% (5/40) of patients were

rebooked for potential consideration of AIT in the future if primary management proved unsuccessful.

**Pre- and post-intervention analysis**

A comparison of referral information between pre- and post-intervention groups was conducted as illustrated in Figure 2. The proportion of patients referred to the PAIC while on treatment, as noted in referral information, had increased significantly from 53% (21/40) to 81% (26/32) in the post-intervention group ( $P = 0.01$ ). The mention of treatment duration in referrals also improved from 23% (9/40) in the pre-intervention group to 50% (16/32) in the post-intervention group ( $P = 0.02$ ). Referral guideline recommendations of maximal medical therapy for at least 2 months before referral was followed in 13% (4/32) of patients in the post-intervention group compared with 5% (2/40) in the pre-intervention group, an increase that was not statistically significant ( $P = 0.39$ ). Furthermore, there was no difference in the pre-hospital management of AR between referring practitioners (GPs or paediatricians).

In cases where duration of treatment was mentioned, more than one-third of patients had treatment initiated at the time of referral (4/9 patients in pre-intervention group and 6/16 in post-intervention group).

There was no decrease in AR referrals compared with other allergy referrals in the 2023 calendar year (21%) compared with previous calendar years (19% in 2022 and 22% in 2021) despite the intervention.

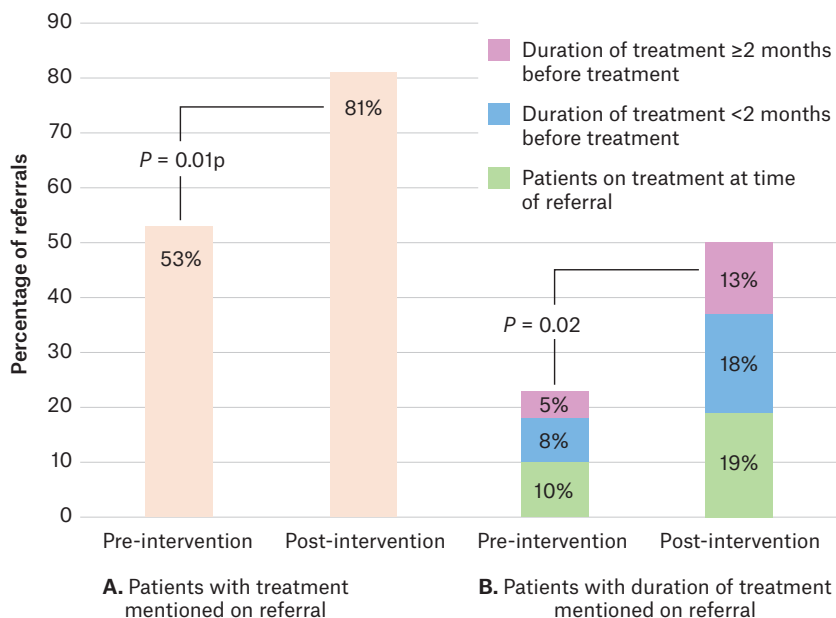
**Declined referrals**

In the period following the intervention, 47% (15/32) of new AR referrals to the PAIC were not accepted. Management in the community 4–6 months after referral non-acceptance is summarised in Figure 1. Two patients were uncontactable despite phone calls made on separate days (total of three attempts) and six patients did not see their referring doctor because of improvement in symptoms. Seven patients returned to their referring doctor to have treatment optimised of whom one was referred to a private allergy/immunology specialist. Notably, none of the patients in this group were re-referred.

**Table 1. Characteristics of allergic rhinitis patients in the pre- and post-intervention groups**

	Pre-intervention group	Post-intervention group	P value
Number	40	32	
Age (mean years ± SD)	10.1 ± 3.2	9.6 ± 3.0	0.50
Male gender	24 (60%)	23 (72%)	0.29
Referred by GP	37 (93%)	25 (78%)	0.08
Aboriginal or Torres Strait Islander background	8 (20%)	4 (13%)	0.40
History of eczema	6 (15%)	3 (9%)	0.47
History of asthma	12 (30%)	11 (34%)	0.69

GP, general practitioner; SD, standard deviation



**Figure 2.** Quality of clinical information in allergic rhinitis referrals in pre- and post-intervention groups. **A.** Percentage of patients on treatment at the time of referral in pre- and post-intervention groups. **B.** Percentage of patients from (A.) with duration of treatment mentioned in the referral.

## Discussion

The PAIC referral audit at Cairns Hospital provided insights into referral patterns for AR and supports the efficacy of a streamlined referral process with educational interventions focused on community management of paediatric AR. In the pre-intervention audit, 68% (27/40) of patients were discharged after primary management strategies were optimised without requiring specialist services. While there was a 28% increase in patients who had initiated treatment at the time of referral between the pre- and post-intervention groups, the proportion of patients who had completed at least 8 weeks of INCS treatment in accordance with FNQ-HP and CPC guidelines rose only modestly from 5% to 13%. This indicates ongoing challenges in integrating evidence-based practice into already busy clinical settings and individual practices and suggests that essential resources supporting guideline-informed care are not readily part of the workflow in primary care.<sup>6,7</sup>

The audit also revealed discrepancies between referral patterns and guideline recommendations, with many referrals requesting specialist review for allergy testing rather than management optimisation.

Post-intervention, the proportion of patients started on treatment increased. However, seasonal factors, such as increased allergen burden in spring and summer months might have influenced these results, whereby patients with worsening symptoms might be more likely to seek treatment. Despite some improvement in referral practices, no overall reduction in AR referrals was observed, possibly due to the short post-intervention period limiting detection of long-term systemic changes.

Evaluation of the intervention's reach and effect by the Cairns Hospital Performance Intelligence Analyst team revealed limited FNQ-HP website traffic on the 'Allergic Rhinitis' page (12 clicks per month). Direct communication with referrers via letters and email newsletters therefore likely had the most impact, which is in keeping with prior studies recommending a 'whole system approach' to feedback and education of referring practitioners in the primary care setting.<sup>20</sup>

Among patients whose referrals were not accepted post-intervention, none required re-referral, and 40% did not seek further care. Reasons cited included symptom improvement

and time constraints, suggesting either mild symptom severity or pre-emptive referrals. This suggests the new referral process, reinforced by educational interventions, provides a safe and effective approach for managing paediatric AR in the community. As a result, the streamlined referral process remains in use at Cairns Hospital.

The study supports existing literature that AR can often be managed effectively at the primary care level without specialist involvement.<sup>21,22</sup> Patients managed according to established guidelines for AR report better quality of life compared with those treated based solely on their GP's discretion.<sup>23</sup> The high discharge rates from PAIC after optimising primary management highlights both the avoidable morbidity patients face while awaiting treatment and the strain on limited outpatient resources. Effective community management results in cost savings, primarily achieved through triaging and referral rejection. With increased awareness and ongoing education, referral patterns should naturally shift, leading to fewer clinician-initiated rejections. This would also serve as an indicator of the intervention's effectiveness.

Integrating the streamlined referral pathway and community education model trialled at Cairns Hospital into state-based CPC, HealthPathways, or local guidelines across Australian hospitals could help standardise referral requirements and strengthen adherence to evidence-based community management. Successful implementation would require collaboration between specialist services, primary care, and health departments, with a focus on improving access to pre-referral advice and education for primary care providers. This approach could optimise outpatient capacity for complex allergy cases, including children with severe disease requiring timely AIT, while supporting the management of milder cases within the community.

## Study limitations

Limitations include the study's observational design at a single centre and reliance on perusal of electronic medical records for data collection. The small sample increases the risk of Type II statistical error in some of the statistical comparisons. The unique demographics and cultural diversity of the

Far North Queensland population might limit generalisability of results to larger, metropolitan hospital settings where access to resources such as immunotherapy might be more accessible or affordable.

The most significant constraint in this project was the brief duration of the post-intervention period and proximity of the post-intervention audit to the intervention, which by its nature would need time to show effect. With clinic wait times averaging >2 years, this presented a significant challenge in comprehensively assessing the full efficacy of the intervention. A re-audit is planned for 24 months after the intervention to evaluate its longer-term effects.

## Conclusion

The current study showed that a streamlined referral process with community focused educational initiatives improved referral quality and led to management of a significant proportion of AR patients in the community. Further research and ongoing quality improvement efforts are needed to refine strategies to optimise outpatient resources, improve timely delivery of services, and enhance overall allergy management in the community. This is especially crucial considering growing demand for allergy services.

## Authors

Mounavi Vemula MBBS, FRACP, Paediatric Immunologist, Cairns Hospital, Cairns North, Qld  
Vishal Kapoor MD, FRACP, Staff Specialist, Department of Paediatrics, Queensland Children's Hospital, Brisbane, Qld; Senior Lecturer and Specialty Supervisor Paediatrics, Children's Health Queensland Clinical Unit, Faculty of Medicine, The University of Queensland, Brisbane, Qld

Peter Bourke BSc (Hons), DipEd, PhD, BMBS, FRACP, Director of Clinical Immunology and Allergy, Department of Medicine, Cairns Hospital, Cairns, Qld; Cairns and Hinterland Hospital and Health Service Clinical Dean, College of Medicine and Dentistry, James Cook University, Cairns, Qld.

Competing interests: None.

Funding: None.

Provenance and peer review: Not commissioned, externally peer reviewed.

AI declaration: The authors confirm that there was no use of artificial intelligence (AI)-assisted technology for assisting in the writing or editing of the manuscript and no images were manipulated using AI.

## Correspondence to:

mounavi.vemula@health.qld.gov.au

## References

References are available online only.

## References

1. Australian Institute of Health and Welfare. Allergic rhinitis ('hay fever') in Australia. Australian Government, 2011. Available at [www.aihw.gov.au/reports/chronic-respiratory-conditions/allergic-rhinitis-hay-fever/contents/allergic-rhinitis](http://www.aihw.gov.au/reports/chronic-respiratory-conditions/allergic-rhinitis-hay-fever/contents/allergic-rhinitis) [Accessed 5 April 2023].
2. Abdullah B, Snidvongs K, Recto M, Poerbonegoro NL, Wang Y. Primary care management of allergic rhinitis: A cross-sectional study in four ASEAN countries. *Multidiscip Respir Med* 2020;15(1):726. doi: 10.4081/mrm.2020.726.
3. Hiscock H, Roberts G, Efron D, et al. Children attending paediatricians study: A national prospective audit of outpatient practice from the Australian Paediatric Research Network. *Med J Aust* 2011;194(8):392–97. doi: 10.5694/j.1326-5377.2011.tb03028.x.
4. Mariño-Sánchez F, Valls-Mateus M, de Los Santos G, Plaza AM, Cobeta I, Mulla J. Multimorbidities of pediatric allergic rhinitis. *Curr Allergy Asthma Rep* 2019;19(2):13. doi: 10.1007/s11882-019-0843-9.
5. National Allergy Council (NAC). Shared Care for Allergy – Project overview. NAC, 2023. Available at [www.practiceassist.com.au/PracticeAssist/media/Practice-Connect/Shared-Care-Project-Overview.pdf](http://www.practiceassist.com.au/PracticeAssist/media/Practice-Connect/Shared-Care-Project-Overview.pdf) [Accessed 10 August 2025].
6. National Allergy Council (NAC). Crisis in the care of allergic patients in Australia 2019. Available at [https://nationalallergycouncil.org.au/images/news/releases/Crisis\\_in\\_the\\_Care\\_of\\_Allergy\\_Media\\_Release\\_FINAL.pdf](https://nationalallergycouncil.org.au/images/news/releases/Crisis_in_the_Care_of_Allergy_Media_Release_FINAL.pdf) [Accessed 10 August 2025].
7. Diwakar L, Cummins C, Lilford R, Roberts T. Systematic review of pathways for the delivery of allergy services. *BMJ Open* 2017;7(2):e012647. doi: 10.1136/bmjopen-2016-012647.
8. Bosnic-Anticevich S, Smith P, Abramson M, et al. Impact of allergic rhinitis on the day-to-day lives of children: Insights from an Australian cross-sectional study. *BMJ Open* 2020;10(11):e038870. doi: 10.1136/bmjopen-2020-038870.
9. Goniotakis I, Perikleous E, Fouzas S, Steiropoulos P, Paraskakis E. A clinical approach of allergic rhinitis in children. *Children (Basel)* 2023;10(9):1571. doi: 10.3390/children10091571.
10. Queensland Audit Office. Report 8: 2021–22. Improving access to specialist outpatient services. Queensland Audit Office, 2020. Available at [www.qao.qld.gov.au/reports-resources/reports-parliament/improving-access-specialist-outpatient-services](http://www.qao.qld.gov.au/reports-resources/reports-parliament/improving-access-specialist-outpatient-services) [Accessed 20 April 2023].
11. Creen J, Kennedy-Behr A, Gee K, Wilks L, Verdonck M. Reducing time between referral and diagnosis in paediatric outpatient neurodevelopmental and behavioural clinics. *J Paediatr Child Health* 2021;57(1):126–31. doi: 10.1111/jpc.15156.
12. Schoch PA, Adair L. Successfully reforming orthopaedic outpatients. *Aust Health Rev* 2012;36(2):233–37. doi: 10.1071/AH11040.
13. Sheikh A, Khan-Wasti S, Price D, Smeeth L, Fletcher M, Walker S. Standardized training for healthcare professionals and its impact on patients with perennial rhinitis: A multi-centre randomized controlled trial. *Clin Exp Allergy* 2007;37(1):90–99. doi: 10.1111/j.1365-2222.2006.02619.x.
14. Levy ML, Walker S, Woods A, Sheikh A. Service evaluation of a UK primary care-based allergy clinic: Quality improvement report. *Prim Care Respir J* 2009;18(4):313–19. doi: 10.4104/pcrj.2009.00042.
15. Liotta M. General practice pilot to ease 'significant impacts' of hay fever. newsGP, RACGP, 2025. Available at [www1.racgp.org.au/newsgp/clinical/general-practice-pilot-to-ease-significant-impacts](http://www1.racgp.org.au/newsgp/clinical/general-practice-pilot-to-ease-significant-impacts) [Accessed 17 May 2025].
16. Australasian Society of Clinical Immunology and Allergy (ASCI). Health professional allergy education and training initiatives supported by ASCIA. ASCIA, 2025. Available at [www.allergy.org.au/national-allergy-strategy](http://www.allergy.org.au/national-allergy-strategy) [Accessed 17 May 2025].
17. Community Health Pathways Far North Queensland. Allergic Rhinitis 2023. Community Health Pathways Far North Queensland, 2023. Available at <https://fnq.communityhealthpathways.org/48465.htm> [Accessed 20 April 2023].
18. Queensland Government. Nasal allergic rhinitis/congestion/obstruction (PAED). Queensland Health, 2018. Available at [www.health.qld.gov.au/cpc/ent/nasal-allergic-rhinitiscongestionobstruction](http://www.health.qld.gov.au/cpc/ent/nasal-allergic-rhinitiscongestionobstruction) [Accessed 17 June 2023].
19. Ogrinc G, Davies L, Goodman D, Batalden P, Davidoff F, Stevens D. SQUIRE 2.0 (Standards for QUality Improvement Reporting Excellence): Revised publication guidelines from a detailed consensus process. *BMJ Qual Saf* 2016;25(12):986–92. doi: 10.1136/bmjqs-2015-004411.
20. Blank L, Baxter S, Woods HB, et al. Referral interventions from primary to specialist care: A systematic review of international evidence. *Br J Gen Pract* 2014;64(629):e765–74. doi: 10.3399/bjgp14X682837.
21. Wise SK, Damask C, Roland LT, et al. International consensus statement on allergy and rhinology: Allergic rhinitis – 2023. *Int Forum Allergy Rhinol* 2023;13(4):293–859. doi: 10.1002/alr.23090.
22. Almousa H, Alsaad SM, Ismail D, Mahjoub S, Bin Obaid S, Alsaleh S. Allergic rhinitis guidelines knowledge, attitudes, and practices among primary health care physicians: A national multicentre cross-sectional study. *J Family Med Prim Care* 2023;12(6):1202–08. doi: 10.4103/jfmpc.jfmpc\_85\_23.
23. Bousquet J, Anto JM, Bachert C, et al. Allergic rhinitis. *Nat Rev Dis Primers* 2020;6(1):95. doi: 10.1038/s41572-020-00227-0.