



## **Impact of Allergic Asthma on Quality of Life of Patients with Chronic Rhino Sinusitis, Itching Eye and Food Allergy**

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### **Abstract**

Allergic asthma, chronic rhinosinusitis (CRS), ocular itching, and food allergies frequently coexist, creating a significant burden on patients' quality of life (QoL). This article aims to examine the multifaceted impact of allergic asthma on QoL in patients who also suffer from CRS, ocular allergy (itchy eyes), and food hypersensitivity. A review of current literature reveals that asthma combined with CRS is associated with worse health-related QoL outcomes compared to either condition alone. For instance, patients with asthma and CRS present with lower scores on validated QoL measures such as the Mini Asthma Quality of Life Questionnaire and EQ-5D index values. The presence of ocular allergy symptoms further complicates disease control and adds to the psychosocial and functional burden, while food allergy adds the dimension of dietary restrictions, anxiety about reactions, and social participation limitations. Using a theoretical framework that classifies impacts across physical, emotional, social, and functional domains, this article synthesizes evidence on how the co-occurrence of these conditions influences daily living: persistent respiratory symptoms reduce sleep quality and physical activity; nasal obstruction and sinus symptoms impair smell/taste and concentration; ocular itching and discomfort limit attention and social interaction; food allergy induces vigilance and avoidance behaviours. The article concludes that integrated management strategies that address all co-morbid allergic conditions are vital for improving QoL. Recommendations include coordinated care models, patient education on disease interrelation, psychosocial support, and tailored therapies that target airway and extra-airway allergic manifestations. Further empirical research is needed in diverse populations to quantify QoL outcomes and evaluate the effectiveness of holistic treatment approaches.

**Keywords:** allergic asthma, chronic rhinosinusitis, quality of life, ocular allergy, food allergy

### **Introduction**

Allergic asthma is a chronic airway inflammatory condition characterised by recurrent episodes of wheezing, shortness of breath, chest tightness, and cough. It often occurs alongside other allergic disorders such as rhinosinusitis, ocular allergy (itchy or watery eyes), and food hypersensitivity. The impacts of these overlapping conditions extend beyond symptomatic burden, affecting physical functioning, sleep, social participation, emotional well-being, and overall quality of life (QoL). Indeed, studies indicate that patients with comorbid allergic conditions fare worse in QoL metrics compared to those with a single disorder.

Among these comorbidities, chronic rhinosinusitis (CRS) is particularly important. CRS is defined as inflammation of the nasal cavity and the paranasal sinuses lasting for 12 weeks or more, and may be with or without nasal polyps. Research has shown that CRS alone significantly reduces health-related QoL (HRQoL), and when it coexists with asthma, the adverse impact is amplified. For example, Ek et al. (2013) found that asthmatic subjects with CRS had significantly lower Mini Asthma Quality of Life Questionnaire (mAQLQ) scores and EQ-5D index values compared to asthmatics without CRS. The synergistic burden arises from the "united airways" concept, which highlights the interconnection between upper and lower airway disease.

Adding ocular allergy (commonly manifested as itchy, watery eyes) further complicates the clinical picture. Allergic conjunctivitis may co-occur with respiratory allergic disorders and contributes to ocular discomfort, fatigue, impaired concentration, and diminished daytime functioning. Food allergy adds a distinct layer of burden: individuals must manage risk of reactions, dietary restrictions, social avoidance, and constant vigilance, all of which impact emotional well-being and participation in normal activities.

Given the high prevalence of these overlapping allergic conditions and their cumulative impact on QoL, it is essential to understand how allergic asthma affects QoL in patients who also suffer from CRS, ocular allergy, and food allergy. This article reviews current evidence, presents a conceptual model of influence across QoL domains, identifies gaps in knowledge, and proposes implications for integrated clinical care and future research.

## Disease Interactions and Mechanisms Affecting Quality of Life

The interplay of allergic asthma with comorbidities such as CRS, ocular allergy, and food hypersensitivity influences QoL through multiple mechanisms:

### 1. Physical symptom burden and functional impairment:

Asthma symptoms (e.g., airway obstruction, wheezing, exacerbations) reduce physical activity, alter sleep, and increase fatigue. CRS adds nasal obstruction, facial pain/pressure, reduced sense of smell/taste, and post-nasal drip, all of which further limit physical functioning (Rădeanu et al.,). Ocular allergy contributes symptoms such as itching, redness, tearing, and blurred vision, impairing concentration and completing tasks. Food allergy introduces risk of acute reactions and the need for constant dietary vigilance, reducing spontaneity in daily life.

### 2. Sleep disturbance and fatigue:

Disturbed sleep is common in both asthma and CRS; nasal congestion and impaired breathing increase night-time awakenings. The combined effect can lead to daytime sleepiness, reduced alertness, and diminished productivity (Rudmik, 2011). Ocular discomfort during night or early morning can also interfere with restful sleep.

### 3. Emotional and psychological impacts:

Chronic symptoms, uncertainty of exacerbations, and the burden of managing multiple allergic conditions produce stress, anxiety, and reduced sense of control. Food allergy in particular is associated with anxiety about accidental exposure and social stigma during meals. Reduced QoL in allergic rhinitis and asthma has been linked to poorer disease control and increased psychological burden (Vieira et al., 2024).

### 4. Social participation and quality of life:

Physical limitations, embarrassment about nasal or ocular symptoms, and dietary restrictions due to food allergy can lead to social withdrawal, reduced participation in leisure activities, and isolation. The reduced ability to smell or taste food (in CRS) further impairs enjoyment of food and social dining experiences (Ek et al., 2013).

### 5. Health economic and work/school productivity effects:

Patients with CRS and asthma have higher healthcare utilisation, more absenteeism, and lower productivity—factors that contribute to lower QoL scores and increased indirect costs (Rădeanu et al.,). For adolescents or working adults, this can translate into academic or occupational setbacks.

## Evidence from Literature on Quality of Life Impact

A pivotal study by Ek et al. (2013) evaluated 605 asthmatic subjects with and without CRS, 110 individuals with CRS only, and 226 controls in the Swedish GA<sup>2</sup>LEN survey. They found that asthmatics with CRS had significantly lower mAQLQ scores and EQ-5D values than asthmatics without CRS, indicating poorer QoL outcomes. They further identified that CRS was an independent negative predictor of QoL in asthmatics ( $p < 0.0001$ ). This underscores the additive burden of CRS in asthma.

Another study by Penezić et al. (2020) evaluated 250 CRS patients (65 of whom had asthma). Although total SNOT-22 scores did not differ significantly between CRS+asthma and CRS only groups, smell and taste impairments were significantly worse among the asthma group ( $p < .013$ ). This suggests that comorbid asthma may exacerbate specific symptom domains influencing QoL.

Furthermore, broader population-based data have shown that both poorly controlled asthma and allergic rhinitis lead to lower health-related QoL as measured by EQ-5D-5L via the MASK-air® app across multiple European countries (Vieira et al., 2024). Their findings

indicate that patients with both allergic rhinitis and asthma had overall lower QoL than those with allergic rhinitis alone, particularly when disease control was sub-optimal.

Although much less literature exists focusing explicitly on ocular allergy plus food allergy in the same patient, it is understood that each additional allergic comorbidity contributes to cumulative burden. The additive effect suggests a higher risk of impaired QoL when allergic asthma occurs alongside CRS, ocular allergy, and food allergy.

## Assessing Quality of Life: Tools and Measures

Quality of life in allergic diseases is often assessed using validated instruments. For asthma, the Asthma Quality of Life Questionnaire (AQLQ) and Mini AQLQ assess symptoms, activity limitation, emotional function and environmental exposure. For CRS, the Sino-Nasal Outcome Test (SNOT-22) is widely used to measure symptom severity and impact on QoL (Rudmik, 2011). Generic tools such as EQ-5D or SF-36 provide broader health-related QoL assessments, allowing comparisons across conditions.

The choice of instrument matters. Studies have demonstrated that individuals with comorbid allergic conditions may score worse across multiple domains (physical, emotional, social), and hence using multidimensional tools provides deeper insight into QoL impacts. Future research is encouraged to integrate instruments capturing ocular and food allergy impacts to more comprehensively measure the full burden in patients with multiple allergic comorbidities.

## Implications for Integrated Management and Improved Quality of Life

Given the evidence that allergic asthma combined with CRS, ocular allergy, and food allergy results in worse QoL outcomes, clinical management should adopt an integrated, patient-centred approach. Key implications include:

1. Multidisciplinary care: Collaboration between pulmonologists, ENT specialists, allergists/immunologists, ophthalmologists and dietitians ensures comprehensive care that addresses all comorbidities.
2. Control of all allergic conditions: Achieving good asthma control and managing CRS symptoms, ocular allergy and food allergy helps reduce cumulative burden and improve QoL (Vieira et al., 2024).
3. Patient education & self-management: Education about the interrelationship of allergic diseases, symptom recognition, proper inhaler/nasal spray/eye drop use, dietary avoidance strategies and emergency planning empowers patients and may enhance QoL.
4. Psychosocial support: Screening for anxiety, depression or social limitations in patients with multiple allergic conditions supports interventions to address emotional and social QoL dimensions.
5. Tailored therapies: Emerging biologics and targeted therapies (e.g., anti-IgE, anti-IL-5) may improve outcomes in patients with type 2 inflammation and multiple allergic diseases. By reducing symptom burden, they may positively influence QoL.
6. Monitoring QoL outcomes: Routine assessment of QoL using validated tools as part of follow-up may help clinicians identify unmet needs and adjust management accordingly.

## Gaps in Research and Future Directions

Despite substantial evidence on asthma and CRS QoL interactions, there are important gaps. Few studies incorporate ocular allergy and food allergy into the QoL assessment of patients with allergic asthma. Longitudinal studies tracking QoL outcomes following integrated management are lacking. The impact of cultural, socioeconomic and dietary factors on QoL in patients with multiple allergic diseases in low- and middle-income countries remains under-explored. Future research should:

- Include comprehensive assessment tools covering respiratory, sinonasal, ocular, and food allergy domains.
- Investigate QoL outcomes in diverse populations, including adolescents and older adults, and in different geographic settings.
- Test the effectiveness of integrated care models and targeted therapies on improving QoL



across all co-morbid allergic conditions.

- Explore economic and productivity impacts of multiple allergic comorbidities on QoL and societal burden.

## Conclusion

The burden of allergic asthma on quality of life is significantly amplified when combined with chronic rhinosinusitis, ocular allergy and food hypersensitivity. These overlapping conditions exert cumulative effects across physical, emotional, social and functional domains. Evidence supports the need for integrated management strategies, multidisciplinary collaboration and routine QoL monitoring to mitigate the negative impact on patients' lives. Bridging current research gaps by including broader comorbidity panels, multiple domains of assessment and diverse population contexts will enhance our ability to improve health-related quality of life in this vulnerable patient group.

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