



# The impact of allergic rhinitis on quality of life: a study in western Iran

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## Abstract

**Introduction:** Chronic diseases, due to their prolonged and debilitating nature, dramatically affect patient quality of life. Allergic rhinitis (AR) is one of the most common chronic diseases. The present study aimed to determine quality of life in patients with allergic rhinitis in Western Iran. **Methods:** In a cross-sectional study, 146 patients with AR were enrolled in this study. The required data were collected using the Rhinoconjunctivitis Quality of Life Questionnaire (RQLQ). The questionnaire was distributed among the patients by a physician and analysis of data was carried out by SPSS version 16. **Results:** Of the total of 146 AR patients admitted to the clinic, 61% were female and 39% were male; the mean age was  $29 \pm 10.17$ . Rhinorrhea (82.2%) was the most common symptom, and moderate to severe intermittent rhinitis (38.4%) was the most common type of the disease. A dramatic reduction in quality of life was observed in 62% of the patients, and the severity of the disease significantly reduced the quality of life ( $P=0.000$ ). **Conclusion:** Allergic rhinitis can adversely affect every aspect of a patient's life, including sleep quality, mood and daily activities.

## Keywords

Allergic rhinitis, quality of life, western Iran

## Introduction

Allergic Rhinitis (AR) is a chronic inflammatory disease that affects the upper respiratory tract and presents with at least one of the classic symptoms including sneezing, itching, nasal congestion and rhinorrhea (Orban et al., 2009; Shariat et al., 2012). The condition may be seasonal (caused by airborne pollens) or perennial (caused by indoor allergens such as mites, house dust, fungal spores and pet dander), or an episodic rhinitis (intermittent exposure to allergens) (M.shiu, 2015). The current prevalence of allergic rhinitis is 10-40%. Environmental changes mainly account for the increasing global prevalence of allergic rhinitis and similar conditions (such as asthma) (Silva, 2009; Szeinbach et al., 2007). The increasing prevalence of allergic rhinitis has turned it into a global health problem, affecting a quarter of the world's population (Orban et al., 2009).

There are wide variations in the prevalence of rhinitis and rhinoconjunctivitis in different countries and even in different regions within the same country (Cibella et al., 2015). However, compared to asthma, allergic rhinitis appears to be a transient and somewhat milder disease. It can substantially affect various aspects of quality of life in patients, including work, education and productivity (Small et al., 2013). Moreover, allergic rhinitis is usually associated with other diseases of the respiratory tract, and the cumulative costs of controlling this condition can negatively affect the socioeconomic aspects of the patient's life (Camelo-Nunes and Sole, 2010). Quality of life is reduced with this condition due to the direct effects of its primary symptoms on the patient's life. Allergic rhinitis also tends to cause sleep disorders, fatigue, impaired memory, depression, etc., all of which contribute to a reduced quality of life (Craig et al., 2004). According to the ARIA (Allergic Rhinitis Impact on Asthma) guidelines, the quality of life in patients with rhinitis dictates their rhinitis classification; for instance, sleep disorders are only associated with the moderate to severe form of rhinitis and not with its mild form (Bachert and van Cauwenberge, 2003).

Quality of life (QOL) signifies wellbeing, welfare, and satisfaction of life; Health Related Quality of life (HRQOL) refers to the part of quality of life associated with health (Van Oene, 2007). The assessment of quality of life has become a major area of interest for clinical research. QOL questionnaires have been developed to assess the effect of clinical management and of reducing the symptoms of chronic diseases on the patients' daily life, and to determine the effect of particular methods of treatment on controlling the disease (Bousquet, 1998; Juniper and Guyatt, 1991; Thompson et al., 2000). The rhinoconjunctivitis quality of life questionnaire (RQLQ) was prepared by Juniper and Guyatt in 1991 to assess the quality of life in patients with rhinoconjunctivitis (Juniper and Guyatt, 1991).

Various studies were performed to assess QOL of AR patients (Meltzer et al., 2009; Valero et al., 2009). Shariat et al. evaluated the quality of life in Iranian patients with allergic rhinitis living in Tehran using the RQLQ. Their study showed

that the severity of the disease adversely affects the patients' quality of life (Shariat et al., 2012). A study conducted in Brazil (2009) showed that allergic rhinitis has adverse effects on psychological and physical health in children (Silva, 2009). Allergic rhinitis in the Kurdistan province located in the western part of Iran is relatively higher than the other regions (Nasiri et al., 2015). According to the effects of allergic rhinitis on patients' quality of life, this assessment could help to create a more active community.

Given the different climates and ethnicities existing in Iran and the subsequent differences in the allergens causing allergic rhinitis, the present study was conducted to assess the quality of life in patients with allergic rhinitis in the Kurdistan province of Iran (city of Sanandaj). This study is different from previous studies in terms of ethnicity and the living environment.

## Materials-Methods

This study was approved by the Ethics Committee of Kurdistan University of Medical Sciences. The present cross-sectional study was conducted on patients over the age of 10 years old who suffered from symptoms of rhinitis such as nasal congestion, rhinorrhea, constant sneezing, and itchy nose for a minimum of four days per week and for a period of at least four consecutive weeks (based on the ARIA guidelines) (Bachert and van Cauwenberge, 2003). Patients were visited by an allergist in the Allergy Clinic of the Be'sat Hospital in Sanandaj (the capital of the Kurdistan province, Iran) between July 2013 and February 2014.

The RQLQ was previously used in a study conducted by the researchers (Shariat et al., 2012). The validity and reliability of the Persian version of the questionnaire had already been confirmed in the previous study (Shariat et al., 2012). The RQLQ contains 16 items on the various aspects of quality of life, including general sleep problems (4 items), having trouble falling asleep (4 items), morning symptoms (4 items), and performance problems during the day (4 items). There were 7 options for answering each item depending on the severity of the symptoms.

The mean score of each individual was calculated based on the answers to the QOL questionnaire and the mean scores for each individual was calculated. The researchers participated in the study without any costs. The participants were provided with all the necessary details on the questionnaires. The patients were interviewed and questionnaires were filled out by the researcher. Chi-square tests ( $\chi^2$  tests) were used to assess the relationship between two categorical variables. The SPSS-16 software was used to calculate the mean, standard deviation (SD), and median for the quantitative variables. P-values less than 0.05 were considered statistically significant (meaningful).

## Results

### Demographic data

A total of 146 participants enrolled; 57 (39%) were male and 89 (61%) were female. The mean age of the study group was  $29 \pm 10.17$  years.

### Clinical findings

Rhinorrhea was the most prevalent symptom among the participants. Other main symptoms of allergic rhinitis included itchy nose, nasal congestion and watery eyes (82%, 70% and 69%, respectively). According to the ARIA guidelines, patients were divided into four groups: a moderate to severe intermittent group that comprised the majority of the patients (38%), a mild intermittent group (19%), a moderate to severe permanent group (27%), and a mild permanent group (15%). Sinusitis was the most common (29%) concomitant disease of allergic rhinitis asthma (12%); a poor sense of smell (7%) and a poor sense of taste (3%) were other concurrent conditions.

**Table 1.** The relationship between quality of life and severity of the disease in patients

Variables		Quality of life (mean scores)		P-values
		Mild (Mean score < 3)	Severe (Mean score $\geq$ 3)	
Severity of the Disease	Mild Intermittent	23 (82.1%)	5 (17.9%)	<0.001
	Moderate to Severe Intermittent	18 (32.1%)	38 (67.9%)	<0.001
	Mild Permanent	9 (40.9%)	13 (59.1%)	<0.001
	Moderate to Severe Permanent	6 (15%)	34 (85%)	<0.001
	Total	56 (100%)	90 (100%)	<0.001

Regarding the RQLQ, the patients' quality of life was divided into two categories, including a mildly-changed category and a severely-changed category. Among the total of 146 patients, the quality of life was mildly affected in 56 (38%) and severely influenced in 90 (62%) patients. Quality of life was reduced significantly in patients with severe intermittent allergic rhinitis ( $p < 0.05$ ). No significant relationships were observed between quality of life and gender ( $p < 0.456$ ). The relationship between quality of life and severity of the disease is

demonstrated in **Table 1**. A significant relationship was found between quality of life and severity of the disease ( $p=0.000$ ).

## Discussion

Allergic rhinitis is one of the most common allergic problems affecting 10-40% of the general population and its prevalence is increasing globally (Silva, 2009; Szeinbach et al., 2007). The present population in our study (61% female and 39% male) was similar to the previous study conducted by Shariat et al. in which 62% of the participants were female and 38% were male (Shariat et al., 2012). In a study by Hubert Chen et al., 37% of participants were female and 63% were male, which is inconsistent with the present study (Camelo-Nunes and Sole, 2010).

Although the present study found no significant relationships between the quality of life and symptoms (including nasal congestion, itchy nose and rhinorrhea) ( $p>0.05$ ), rhinorrhea was found to be the most common (82%) symptom of allergic rhinitis. In a study conducted by Mohammadi et al. in Tehran, rhinorrhea was also the most common symptom of allergic rhinitis, although the researchers did not investigate quality of life in those patients (Mohammadi et al., 2008). Nevertheless, Shariat et al. reported nasal congestion to be the most common symptom of the disease and found a significant relationship between nasal congestion and quality of life impairment in patients (Shariat et al., 2012).

Moderate to severe intermittent allergic rhinitis was found to be the most frequent (38%) type of the disease in the study group. This is different from a previous study in which Shariat et al. reported the severe permanent type as the most frequent (34%) type (Shariat et al., 2012). The disparity of the findings may be attributed to climate differences. For instance, in Tehran symptoms are permanent due to apartment living and air pollution, while in Sanandaj symptoms are intermittent or seasonal due to more open spaces, abundant trees and frequent winds in the region. This claim is supported by the fact that rhinorrhea (which is a symptom indicative of a seasonal allergy) was the most common symptom of allergic rhinitis in Sanandaj. However, nasal congestion was the most common symptom of the disease in the previous study, which is indicative of a permanent allergy (Shiomori et al., 2007).

We can see that a total number of 117 patients were found to have concomitant diseases, with the highest frequency pertaining to sinusitis (29%) and then asthma (12%). These findings are in accordance with the prior study by Shariat et al. which reported the prevalence of these two concomitant diseases with similar frequency percentages (Shariat et al., 2012). Inflammation of the nasal mucosa causes edema and congestion of the sinus cavities, leading to sinusitis.

The results of the present study showed, in the majority of patients, that their quality of life had been affected by problems caused by allergic rhinitis, including general sleep problems, morning symptoms, and practical problems during wake time. In the studies conducted by Shariat et al. (Shariat et al., 2012), Hubert Chen et al. (Chen et al., 2005), and Monico Mit et al. (Monique et al., 2008), more than 60% of the patients suffered from sleep problems and also problems when awake. In the present study, we found that patient quality of life was affected by severe sleep problems (and problems during wake time) in 62% of the patients.

In this study, no significant relationship was found between quality of life and gender ( $p=0.456$ ), although women had a better quality of life compared to men; this observation may be related to their presence in the home and less exposure to allergens. Shariat et al. did not find any meaningful relationship between gender and quality of life as well (Shariat et al., 2012). In a study conducted by Damian Leger, no significant relationships were reported between gender and quality of life, but the overall performance of women was reported to be better than that of men (Leger et al., 2006).

In our study, no significant relationships were observed between quality of life and any one of the symptoms (e.g. nasal congestion, itchy nose, rhinorrhea, and itchy and watery eyes). However, Shariat et al. found a significant relationship between quality of life and nasal congestion (Shariat et al., 2012). The disparity of findings may be attributed to the difference in the type of rhinitis examined, as permanent rhinitis can affect the patients' quality of life more significantly while intermittent rhinitis (as was the case in Sanandaj) did not affect the patients' quality of life significantly.

The results obtained from the present study showed a significant relationship between quality of life and severity of the disease. Patients with severe permanent or intermittent disease had a poorer quality of life since the severity of the disease and associated symptoms tended to affect the patients' physical and mental well-being, thus making their life more difficult. These observations are consistent with those from studies conducted by Shariat et al. (Shariat et al., 2012), Carlos Henrico et al. (Silva, 2009), Damian Leger et al. (Leger et al., 2006), and Jaruvongvanich et al. (Jaruvongvanich et al., 2016) which showed that patients with a more severe type of the disease have a poorer quality of life.

## Conclusion

Allergic rhinitis can adversely affect sleep quality, mood, and daily activities in the patients examined in Sanandaj. Given the significant effects of these symptoms on the patients' quality of life, making an early diagnosis of the disease is the first step to overcoming it. The subsequent steps are reducing

environmental allergens and taking measures to prevent the incidence of concomitant diseases, such as asthma and sinusitis.

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## Abbreviations

AR: Allergic rhinitis

RQLQ: Rhinoconjunctivitis Quality of Life Questionnaire

ARIA: Allergic Rhinitis Impact on Asthma

QOL: Quality of life

HRQOL: Health Related Quality of life

## Author Contribution

All authors contributed to the design of the research. RNK, MS, JS and MT collected the data. ZK, SK and RNK conducted analysis and interpretation of data. All authors drafted the first version. RNK, SK, ZK, MT and JS edited the first draft. All authors reviewed, commented and approved the final draft.

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