

# The Effect Of Patient Education On Health Related Quality Of Life Among Allergic Rhinitis Patients In Cairo University Outpatient Clinics, Egypt

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**Abstract:** Allergic rhinitis (AR) is a chronic inflammatory disorder of the nose. Although it is not a life-threatening condition, it has been documented to have a significant effect on health related quality of life (HRQoL). This was a prospective interventional study conducted over a cohort of AR patients to assess the effect of patient education on their HRQoL through the Rhinoconjunctivitis Quality of Life Questionnaire/ with Standardized Activities RQLQ(S). Patients were randomly divided into two groups (each contained 100 patients) where Group (A) received both pharmacological treatment and patient education while Group (B) received pharmacological treatment alone. RQLQ(S) was used to measure the patients' HRQoL for both groups during the pre and post intervention phases. In the pre-interventional phase, both studied groups were homogenous in the RQLQ(S) domains mean scores and also in the total RQLQ(S) mean scores with no statistical significance between them. In the post-interventional phase, the RQLQ(S) total mean score showed improvement with statistical significance between both groups with better score to the group (A) with a total mean score of  $3.38 \pm 0.68$  while group (B) scored  $3.66 \pm 0.55$ . RQLQ(S) domains mean scores showed improvement in almost all the domains, where Group (A) showed better mean scores in six domains. Providing structured patient education on AR has improved the patient's RQLQ(S) scores more than the pharmacological treatment alone. Patient education is an essential component in the managing AR patients.

**Index Terms:** Allergic rhinitis, Patient education, Rhinoconjunctivitis Quality of Life Questionnaire/ with Standardized Activities.

## 1 INTRODUCTION

Allergic rhinitis (AR) is a chronic inflammatory disorder of the nose. Although it is not a life-threatening condition, it has been documented to have a significant effect on quality of life [1]. AR is defined as a symptomatic disorder of the nose, induced after allergen exposure, by an IgE mediated inflammation of the nasal membranes [2]. It is recognized as one of the most common condition which has considerable effects on quality of life (QoL) as it could result in sleep disturbance, fatigue, listlessness irritability, poor concentration and socially unacceptable behavior such as sniffing, sneezing, noisy breathing and coughing that may lead to isolation and rejection. It has been identified as one of the top ten reasons for visits to primary care clinics. The total burden of allergic rhinitis lies on impaired physical and social functioning [3]. Beside its direct effect on the quality of life, allergic rhinitis has also significant co-morbid disorders such as asthma, sinusitis, otitis media [4].

Globally allergic rhinitis constitutes a worldwide public health problem with a prevalence of 10% to 40%. 5 Time trend studies of the prevalence of allergies in Africa show a consistent increase over a period of 7–10 years [6]. Self reported prevalence of allergic rhinitis (having symptoms in the past 12 months) was 36% among adolescents and adults in gulf & near east [7]. An increasing prevalence of AR in developing countries was noticed 8 due to the introduction of Western life style [9] and environmental factors [10]. In Egypt the accurate epidemiological data are scarce. However, it was found that the prevalence of rhinoconjunctivitis was 15.3% among a sample of 2,645 school children of 11-15 years old in Cairo [11].

## 2 PROCEDURE

### 2.1 METHODS

The present prospective interventional study was conducted at the Family Medicine and Ear Nose and Throat (ENT) outpatient clinics in Kasr Al-ainy teaching hospital, Cairo University, between June 2012 and December 2013. A quota sample of 200 AR patients were recruited over a period of 6 months in the period between October 2012 and April 2013. Overall 845 patients attending these clinics during the period of the study were screened for AR and the diagnosis was based on the Score for Allergic Rhinitis (SFAR)  $\geq 7$ [12]. Those fulfilling the criteria (aged 18-65 years, and did not have past ENT operation nor cognitively impaired) and agreed to join the study were subjected to:

- I- Skin prick test (SPT) towards the most environmentally common allergic triggers. The kits were prepared in the allergy unit in Ain-Shams University and it includes fourteen allergens: Tobacco, mixed pollens, Candida, aspergillus, house dust, mites, hay, mixed feather, cat hair, cockroach emanations, banana, strawberry, fish and egg.
- II- Fulfill the socio-demographic data sheet.

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- Aim: It aimed at improving the patient's quality of life through patient education that increases the patient's awareness about AR. It also aimed at changing some attitudes, and teaching some skills for the correct usage of medication.

III- Complete the Rhinoconjunctivitis Quality of Life Questionnaire with Standardized Activities / RQLQ (S) [13].

## 2.2 RQLQ (S)

RQLQ (S) has 28 questions in 7 domains {activity limitation (3 items), sleep problems (3 items), nose symptoms (4 items), eye symptoms (4 items), non-nose/eye symptoms (7 items), practical problems (3 items) and emotional function (4 items)}. Patients recall how bothered they have been by their rhinoconjunctivitis during the previous week and respond to each question on a 7-point scale (0 = not troubled, 1= hardly troubled, 2= somewhat troubled, 3= moderately troubled, 4= quite a bit troubled, 5= very troubled and 6 = extremely troubled). The total RQLQ(S) score is the mean of all 28 responses and the individual domain scores are the means of the items in those domains. Each domain has a mean score from 0-6 [13].

## 2.3 RANDOMIZATION

Patients were randomly divided into two groups were Group (A) received both pharmacological treatment and patient education while Group (B) received pharmacological treatment alone. RQLQ(S) was assessed for both groups pre and post intervention after two months. Therapeutic intervention followed the ARIA guidelines [14]. Second generation antihistaminic (Fexofenadine 60 mg BID) was prescribed for the patient with mild and moderate to severe allergic rhinitis whether intermittent or persistent while intranasal corticosteroid spray (Fluticasone propionate 50 mcg /dose BID) was prescribed to the patients with moderate to severe persistent or intermittent AR or in mild persistent cases.

## 2.4 PATIENT EDUCATION PROGRAM

It aimed at improving the patient's quality of life through patient education that increases the patient's awareness about AR and aimed also at changing some attitudes, and teaching some skills for the medication usage.

**2.4.1 Timing:** It took average of 15 minutes for every patient through person to person interview.

**2.4.2 Site:** It was conducted in both the Family Medicine and ENT outpatient clinics in Kasr Al-ainy hospital, Cairo University.

**2.4.3 Tools:** Patient education hand outs together with an intranasal corticosteroid device for illustration the steps of usage.

**2.4.4 Educator:** The Researcher.

**2.2.5 Evaluation:** It was done by measuring the patient's HRQoL using the RQLQ(S) before the intervention and after 2 months of the intervention after 2 months

## 2.4.6 Content:

- Defining AR and giving the patients a general background on its prevalence, clinical presentations, different types of rhinitis and its genetic basis.
- AR complications if left untreated and its alarming signs.
- Allergic triggers awareness and different tips for allergens avoidance.
- Patient education also included a background on the

options of therapies tailored to each patient, its advantages and the appropriate usage of the intranasal device and how to avoid its side effects.

- Proper usage of nasal saline irrigation.
- Highlighting the chronic nature of AR and the importance of continuous treatment and follow up.

## 2.5 DATA ANALYSIS:

All collected questionnaires were revised for completeness and logical consistency. Data were coded and entered in an Excel sheet. All statistical calculations were done using computer program SPSS (Statistical Package for the Social Science; SPSS Inc., Chicago, IL, USA) version 15 for Microsoft Windows. Data were statistically described in terms of mean  $\pm$  standard deviation ( $\pm$ SD) or frequencies (number of cases) and percentages when appropriate. Comparison of quantitative variables between the two study groups was done using Student t test. Within group comparison was done using paired t test. For comparing categorical data, Chi square ( $\chi^2$ ) test was performed. Exact test was used instead when the expected frequency is  $< 5$ . P-values  $< 0.05$  were considered statistically significant.

## 2.6 ETHICAL CONSIDERATION

The study was conducted after the approval of Family Medicine Departmental Ethics Committee on the 10th of April 2012. Approval for usage of the RQLQ was obtained by mailing the QOL Technologies Ltd and RQLQ package was sent in both Arabic and English languages. Verbal consent was obtained before patient recruitment and confidence of all questions forms and the study data were guaranteed based on the revised Helsinki declaration and biomedical ethics [15].

## 3 RESULTS

Out of 845 screened patients, 200 of them had AR (23.7%), with a mean age of  $32.9 \pm 11$  years. Females constituted 84.5% (n=169) of the patients. In addition, 35.5% (n=71) of all patients were illiterate and only 11% (n=22) reached their university level of education. Those unemployed represented 74.5% (n=149) of all patients. Regarding the smoking status; 59% (n=118) were non smoker, 28% (n=56) second hand smokers, 12% (n=24) were smoking and only 1% (n=2) were ex-smokers. The smoker females represented 3% while smoker males were 9% of all studied patients. About 81% of the studied patients had a family history of allergy. Regarding the ARIA classification for AR; the mild-intermittent cases represented 49% (n=98) of our patients, the moderate/severe persistent cases 27.5% (n= 55), the mild-persistent cases 12.5% (n=25) and the moderate /severe-intermittent cases represented 11% of all AR patients. A high percentage of the AR patients had a co-morbid conjunctivitis (93.4%). In the current study 79% (n=158) of patients were previously diagnosed to be having allergic rhinitis (previously perceived allergic status). Only 21% (n=42) of our study group did not previously perceive their allergic status. In the pre-interventional phase both studied groups were homogenous over the RQLQ(S) domains mean scores. Group (B) scored a slightly higher score in the total RQLQ(S) with a mean score of  $4.0 \pm 0.8$  compared to the group (A) ( $3.85 \pm 0.8$ ), with no statistical significant differences between them (P = 0.989) The most affected domain was the practical problems domain with a total mean score of  $4.69 \pm 1.2$ . The least affected domain was the eye symptoms domain with a mean score of  $2.89 \pm 1.4$ , as shown in table (1).

**Table (1):** Pre-interventional total mean scores of the allergic rhinitis quality of life domains among the studied groups.

Domains (Mean ± SD)	Groups		Total (n=200)	P-Value
	Group A <sup>1</sup> (n=100)	Group B <sup>2</sup> (n=100)		
Activity	3.0 ± 1.2	3.04 ± 1.2	3.0 ± 1.2	0.843
Sleep	3.6 ± 1.6	3.7 ± 1.5	3.7 ± 1.6	0.585
None nose/eye symptoms	4.2 ± 1.1	4.3 ± 1.0	4.1 ± 1.1	0.732
Practical problems	4.7 ± 1.2	4.6 ± 1.2	4.69 ± 1.2	0.891
Nasal Symptoms	4.5 ± 1.0	4.4 ± 1.0	4.45 ± 1.0	0.638
Eye symptoms	2.9 ± 1.4	2.8 ± 1.4	2.89 ± 1.4	0.699
Emotional domain	4.22 ± 1.2	4.21 ± 1.2	4.21 ± 1.2	0.954
Total score	3.85 ± 0.8	4.0 ± 0.8	3.9 ± 0.8	0.989

<sup>(1)</sup> Group A: Pharmacological treatment plus patient education

<sup>(2)</sup> Group B: pharmacological treatment only

In the post-interventional phase; there was improvement in the total RQLQ (S) mean score were group (A) had a better total RQLQ(S) mean score of 3.38 ± 0.68 compared to group (B) which scored 3.66 ± 0.55 and shows statistical significant difference (P-Value = 0.007). Quality of life mean scores showed improvement in almost all of its domains with Group (A) showing better scores in six domains (activity, sleep, none nose/eye symptoms, practical problems, nasal symptoms and emotional symptoms domains) except for the eye symptoms domain which shows more improvement in the Group (B). The activity domain, sleep domain and the emotional domain all showed statistical significant difference between both studied groups with a mean scores of 2.85 ± 1.06, 3.13 ± 1.39 and 3.56 ± 0.81 for group (A) and mean scores of 3.49 ± 0.88, 3.71 ± 1.19 and 3.85 ± 0.62 for group (B), respectively. This is shown in table (2).

**Table (2):** Post-interventional total mean scores of allergic rhinitis quality of life domains among the studied groups.

Domains (Mean ± SD)	Groups		Total (n=140)	P-Value
	Group A <sup>1</sup> (n=82)	Group B <sup>2</sup> (n=58)		
Activities	2.85 ± 1.06	3.49 ± 0.88	3.12 ± 1.04	0.001
Sleep	3.13 ± 1.39	3.71 ± 1.19	3.37 ± 1.34	0.01
None nose/eye symptoms	3.95 ± 0.98	4.19 ± 0.78	4.05 ± 0.91	0.114
Practical problems	3.76 ± 0.914	4.01 ± 0.88	3.86 ± 0.91	0.104
Nasal Symptoms	3.59 ± 0.86	3.79 ± 0.78	3.69 ± 0.83	0.166
Eye symptoms	2.80 ± 1.21	2.61 ± 1.34	2.72 ± 1.26	0.365
Emotional domain	3.56 ± 0.81	3.85 ± 0.62	3.68 ± 0.75	0.023
Total score	3.38 ± 0.68	3.66 ± 0.55	3.50 ± 0.65	0.007

<sup>(1)</sup> Group A: Pharmacological treatment plus patient education

<sup>(2)</sup> Group B: pharmacological treatment only

By comparing the results between the pre and post interventional phases regarding group (A) the results showed statistical significant difference in the total RQLQ(S) mean scores ( P-value = 0.01) and also showed statistical significant difference in all the RQLQ(S) domains mean scores except the activity domain and the emotional domain which showed no statistical significant difference in both phases. Regarding Group (B), there was improvement in the total RQLQ(S) mean score and almost all the RQLQ(S) domains mean scores (except the activity domain which showed no improvement), but it only showed statistical difference in the activity domain (P-value = 0.001) , practical domain (P-value < 0.001) and the nasal symptoms domain mean score (P-value < 0.001) as shown in table (3).

**Table (3):** Comparison between studied groups regarding quality of life domains in the pre and post interventional phases.

Domains (Mean ± SD)	Group A <sup>1</sup>			Group B <sup>2</sup>		
	Pre (n=100)	Post (n=82)	P-value	Pre (n=100)	Post (n=58)	P-value
Activities	3.0 ± 1.2	2.85 ± 1.06	0.181	3.04 ± 1.2	3.49 ± 0.88	0.001
Sleep	3.6 ± 1.6	3.13 ± 1.39	< 0.01	3.7 ± 1.5	3.71 ± 1.19	0.761
None nose/eye symptoms	4.2 ± 1.1	3.95 ± 0.98	< 0.001	4.3 ± 1.0	4.19 ± 0.78	0.102
Practical problems	4.7 ± 1.2	3.76 ± 0.914	< 0.001	4.6 ± 1.2	4.01 ± 0.88	< 0.001
Nasal Symptoms	4.5 ± 1.0	3.59 ± 0.86	< 0.001	4.4 ± 1.0	3.79 ± 0.78	< 0.001
Eye symptoms	2.9 ± 1.4	2.80 ± 1.21	0.432	2.8 ± 1.4	2.61 ± 1.34	0.147
Emotional domain	4.22 ± 1.2	3.56 ± 0.81	< 0.001	4.21 ± 1.2	3.85 ± 0.62	0.067
Total score	3.85 ± 0.8	3.38 ± 0.68	< 0.001	4.0 ± 0.8	3.66 ± 0.55	0.062
Total number	100	82		100	58	

<sup>(1)</sup> Group A: Pharmacological treatment plus patient education

<sup>(2)</sup> Group B: pharmacological treatment only

#### 4 DISCUSSION

In the current study, the non smokers unexpectedly represented 59% of the studied group. This runs in parallel with a study conducted in Denmark on a sample of 1,370 subjects, where there was more tendency toward nonsmokers (77.9%) among those who had onset of AR [16]. The current study population constituted mostly of mild intermittent patients (49%) while the moderate/severe patients represented



(27.5%) of the studied patients. This is in contrast with another study conducted on 540 patients in 2013 which observed that 54.5% of the study group was moderate/severe persistent patients, with only a few (12.2%) mild intermittent patients [17]. In the current study 79% of patients were previously diagnosed to have allergic rhinitis (previously perceived allergic status). Only 21% of our study group did not previously perceive their allergic status, they thought of having recurrent episodes of common cold. Our results run in accordance with a study conducted in 2006, where among 571 patients with AR, 32% were undiagnosed (unaware of their AR status) [18]. It was observed that development of atopy in the absence of parental family history was only 17% [16]. This runs parallel with our study where 81 % of the allergic rhinitis patients had a positive family history of atopy. The current study showed that in the pre-interventional phase both group (A) and group (B) were almost homogenous in all the RQLQ(S) domains and in the total RQLQ(S) mean scores, with no statistical significant difference between both groups. It was detected that our AR patients were moderately troubled to quite a bit troubled by their allergic rhinitis with a total RQLQ(S) mean score of  $3.9 \pm 0.8$ . That is higher than the total quality of life mean score in a research conducted in 2007, which recorded that patients were hardly troubled or only somewhat troubled by their AR symptoms with a mean score of  $2.1 \pm 1.3$ . [17] Our study result also was higher than another study, where all the quality of life domains were moderately affected (2.26 to 3.75) [21]. In the current study 93.4% of allergic rhinitis patients presented by associated ocular symptoms, it is nearly matching with a study conducted in Europe, where up to 71% of allergic rhinitis patients complain from both nasal and ocular symptoms [20]. In the pre-interventional phase, the least affected domain was the eye symptoms domain (including itchy eyes, watery eyes, sore eyes and swollen eyes). Although the conjunctivitis represented a high percentage of co-morbidity (93.4% of patient had conjunctivitis), it was not severely affecting the quality of life and scored lower scores in RQLQ(S). This agreed with a study conducted in 2013, where the ocular symptoms were considered trivial illness by almost most of the patients and were not considered the main complain [2]. In another study the lowest scores were observed in sleep disturbance and ocular symptoms domains [21]. In the pre-interventional phase, the most affected domain was the practical problems domain (including the inconvenience of having to carry tissues, the need to rub the nose or eye and the need to blow the nose repeatedly). Our result also agreed with another study conducted in 2008, where the most affected areas were the nasal symptoms and practical problems domains [21]. In the pre-interventional phase, the activities domain (which included regular activities in home and work, social activities and outdoor activities) showed a total mean score of  $3.0 \pm 1.2$ . While a study conducted in Hungary in 2012, reported that a high percent of moderate to severe AR patients (66%) reported mild difficulties on their daily activities, while 8.5% of them had considerable difficulties because of AR on their daily activities [22]. Regarding the emotional domain (including the frustration, irritability and embarrassment caused by AR symptoms), it scored a total RQLQ(S) mean score of  $4.21 \pm 1.2$  in the pre-interventional phase. This is supported by another study, in which the majority of AR patients reported that they frequently or sometimes experienced emotional problems during the worst month of symptoms: 67% said that they frequently or sometimes felt

irritable, 60% said they felt miserable, 28% said they felt depressed, 25% said they felt anxious, and 15% said they felt embarrassed. Even more, 85% reported that they frequently or sometimes felt tired during the worst month of allergy symptoms [23]. By comparing both RQLQ(S) domains scores (pre-interventional and post-interventional), there was improvement in patients' quality of life in almost all the domains which showed statistical significant difference in group (A) (P-value < 0.001) and with no statistical significant difference in group (B) (P-value = 0.062). When comparing the two groups in the post-interventional phase, Group (A) had a better total RQLQ(S) mean score than group (B) and showed a statistical significance (P-Value = 0.007). The post-interventional RQLQ(S) mean scores showed improvement in almost all of its domains. Group (A) had better mean scores in six domains (activity, sleep, none nose/eye symptoms, practical problems, nasal symptoms and emotional symptoms domains) except for the eye symptoms domain which shows slight more improvement in the Group (B). This could be explained that group (A) already was having worse quality of life eye symptoms score in the pre-interventional phase than that of group (B). In the post -interventional phase, the activities domain showed statistical significant difference between both studied groups (P-value < 0.001). Group (B) had a higher activities domain mean score in the post-interventional phase compared to that in the pre-interventional phase, which could not be explained. In the post -interventional phase, sleep domain mean score was better in group (A) than that of group (B), and showed also a statistical significant difference between both groups (P-value = 0.01). This could be supported by a study which reported that treatment of AR leads to better quality of sleep, decrease daytime somnolence, and improved quality of life [2]. In the post -interventional phase, the emotional domain also showed a statistical significant difference between both studied groups (P-value = 0.023) with group (A) scoring better score. It was expected that the emotional domain would take better scores for QoL in the group (A), as the patient educational program was addressing the psychological aspects of the patient and trying to decrease the sense of frustration with giving hope of improvement while knowing more about the chronic nature of the disease was expected to drive the AR patients more calm and less embarrassed after symptoms reduction by allergen avoidance. Another study conducted in 2006, observed an unexpected observation, that medical treatment alone has no effect on AR symptoms and RQLQ global score. Many patients with AR do not show well symptoms control despite treatment following guidelines. These patients still have moderate to severe symptoms and a QOL similar to untreated patients with symptoms of the same severity [24]. This could support our result that the patient centered approach and providing structured patient educational programs directed to the AR patient will add more benefit on both the symptomatic prognosis and the quality of life outcomes of the treated patients, than those who were treated only with the traditional pharmacological treatment alone. However two AR patients could have exactly the same symptoms severity but they record different QoL score depending on the patient degree of perception and interpretation. Some limitations were faced like the current political circumstances in Egypt which affected the number of patients in the follow up visits and increased the drop-outs.

## 5 Conclusion

The study also concluded that patient education had a positive impact on the HRQoL of AR patients so it was recommended to consider it as an essential component in the management plan for all AR patients to insure better outcome.

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