

# Role of Cognitive Emotion Regulation Strategies on Mental Health and Quality of Life in Allergic Patients

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## Abstract

**Introduction:** The aim of the present study was to investigate the psychological profile and quality of life in allergic patients and to identify the role of cognitive emotion regulation strategies in this field.

**Method:** The statistical population of this study consisted of all patients with allergic rhinitis who referred to the asthma and allergy clinic of Ghaem Hospital in Mashhad during summer to autumn, 2017. Among these patients, 132 were selected according to inclusion and exclusion criteria. Data were collected using the Psychological Health Checklist, the World Health Organization Quality of Life Questionnaire and the Short Form Cognitive Emotion Regulation Questionnaire.

**Results:** The results of multivariate regression analysis showed that self-blame, other blame and rumination have a significant and positive relationship with symptoms of mental health disorders which can predict them significantly ( $p < 0.001$ ). Also, positive refocusing and planning have positive significant relationships with quality of life and can predict them significantly ( $p < 0.001$ ).

**Conclusion:** This study demonstrates the role of cognitive emotion regulation strategies on mental health and quality of life in these patients. Findings draw the attention of therapists to the importance of applying psychological therapies and cognitive emotion regulation strategies training in the treatment process of allergic patients.

**Keywords:** Allergic Rhinitis, Emotion, Quality of Life, Psychological Profile

## Introduction

Allergic rhinitis, as a type of chronic inflammatory disorder [1], is an inappropriate and often harmful immune response to substances that are naturally harmless. Common allergic reactions occur when the immune system of a susceptible person reacts strongly to a substance (such as dust, pollen, feathers and animal hair) [2].

Today, with the increasing trend of exposure to allergens such as presenting in closed rooms for a long time and other socio-economic reasons, the prevalence of the disease has increased [3] and it has affected a significant percentage of the world's population [4]. The prevalence of allergic rhinitis in Iran in the cities of Babol, Karaj, Zanjan and Birjand is estimated to be 10 to 15 percent [5] and this rate is increasing.

Symptoms include nasal itching and congestion, watery rhinorrhea, and sneezing. Although symptoms of allergic rhinitis are not life threatening, they can adversely affect the physical, psychological, and social aspects of people's lives and can severely affect their quality of life. Studies have shown that nasal congestion, considered by allergic rhinitis patients as the most difficult symptom, can cause intermittent or inadequate sleep [6] and most of these people do not have appropriate sleep which can lead to sleepiness, cognitive and perceptive problems, fatigue and irritability in the day [7] and depression throughout the night.

According to previous research, symptoms of this disease can influence the emotional, physical, and social aspects of quality of life through their effects on individuals daily function at school and home which lead to depression and anxiety [8]. Psychological evaluation on men with allergic rhinitis showed that they had significantly higher scores on depression, paranoia, and social introversion, and women received higher scores of depression, hypochondriasis and hysteria significantly. The conducted research has also presented that people with allergic rhinitis showed anxiety, obsession, and neuroticism more than non-allergic individuals, and depression, anxiety, hostility, hypochondriasis, somatization, and avoiding personality traits were associated with seasonal allergy [9]. On the other hand, a number of studies have shown that the onset of allergic symptoms can be associated with a specific type of psychosis that commonly occurs in childhood [10].

Thus, the relationship between psychological status and allergic disease is a two-way relationship, and whether mental disorders are caused by the allergy or are resulted from allergy is still questioned [11]. What is clear is that the prevalence of mental disorders, especially depression and anxiety, is higher in allergic rhinitis patients than the general population [12, 13]. Therefore, it can be stated that the nervous and immune systems interact mutually and regulate each other [14,15]. So, patients with allergic rhinitis have weaker cognitive functions compared to people without this disease and they suggest allergic rhinitis as one of the psychological complaints that are being studied in the field of psycho-immunology [11]. Therefore, the role of psychological factors in this disease is a subject which should be considered [16].

Many authors have analyzed that there is strong association between allergic / atopic diseases and psychological disorders such as depression and anxiety [17, 18]. Allergic rhinitis and poor mental health are associated with stress, depressed mood and suicidal thoughts [12]. Therefore, in addition to the physical symptoms of the allergy disease, the psychological problems associated with it also dramatically decrease the quality of life of those affected [19]. Understanding and managing the psychological problems associated with chronic physical illness can improve the life quality of patients. Thus, what is obvious is that the individual's physical illness can impair physical and functional abilities and create a frustrating situation for the patient, leading to a decrease in self-esteem and hope. In these conditions, physical illness makes a person psychologically vulnerable and the quality of his/ her psychological indicators is reduced. Psychological indicators are: depression, anxiety, interpersonal sensitivity, obsessive-compulsive disorder, phobia, paranoia, and psychoticism. We examined these indicators in the form of psychological profile [20].

Patients with allergic rhinitis, in addition to the depressed and distressed psychological profile, are also characterized by increased emotional sensitivity [10]. Emotion can act as an effective psychological factor and play an important role in various aspects of life such as

coping with life changes and stressful events [21-23]. People with chronic physical illnesses who experience psychological problems and low quality of life can better cope with the psychological problems and experience a better life quality through adopting cognitive emotion regulation strategies [24].

The severity and recurrence of physical illnesses also decrease with reducing psychological problems. Therefore, emotion regulation is a fundamental principle in initiating, evaluating, and organizing adaptive behavior as well as preventing negative emotions and maladaptive behaviors and is thought to be an important factor in determining successful or well-being performances [24].

It seems that people with some pathological disorders are impaired in some or more emotion regulation strategies. Overall, the results show that people who use maladaptive strategies such as rumination and self-blame are more vulnerable to emotional problems than others while people who use adaptive strategies such as positive reassessment are less vulnerable [19]. Using adaptive strategies to regulate emotions is effective in modulating cognitive stress and prevents chronic illness. On the other hand, the use of maladaptive strategies in emotion regulation causes some psychological problems such as depression, anxiety, aggression, and violence [21].

Numerous studies have shown links between cognitive emotion regulation strategies and quality of life in a variety of diseases, including cancer, multiple sclerosis, chronic pain, and in dialysis patients, but so far, based on the available evidences, this link has not been addressed in allergic diseases such as allergic rhinitis [25].

Since mental health is of great importance in preventing and treating diseases and allergic rhinitis is a chronic and very common disease with very effective symptoms on patients' quality of life, it is important to investigate mental health in the allergic patients. In addition, as cognitive emotion regulation strategies used by people with allergy may have a determining impact on their mental health and quality of life and since no study has been conducted in this regard, the problem of the present study was predicting the psychological profile and quality of life of allergic patients with regard to cognitive emotion regulation strategies. The results of the present study can play a significant role in allergic patients' mental health along with using psychological therapies and trainings with pharmacotherapy.

## Method

The research method of this study was descriptive-correlational. The statistical population of the study consisted of patients with allergic rhinitis who referred to the asthma and allergy clinic of Ghaem Hospital in Mashhad in summer and autumn of 2016. The sampling was done through the convenient method. For this purpose, 132 patients who had been diagnosed with allergic rhinitis in the age range of 15- 50 years were selected. Exclusion criteria included: having other allergic and non-allergic diseases and acute psychiatric illness such as psychotic disorders.

The following questionnaires were used to collect data:

### Quality of Life Questionnaire:

This questionnaire, which has been developed by the World Health Organization in 1989, has 26 questions and measures four domains including physical health, mental health, social relationships, and environmental health. The questions have a five choice of answers. The first two questions assess the general domain of quality of life, and the other questions assess one's feelings and behavior in different dimensions of quality of life. In each domain, score 4 indicates the worst condition while score of 20 indicates the optimal condition [26]. In Iran, Nejat et al. have standardized this scale in a healthy population and reported the alpha coefficients for physical health, mental health, social relations and environmental communications as 0.70, 0.73, 0.55 and 0.84 respectively. The reliability coefficient of the retest method was reported to be 0.70 after two weeks [27].

**Cognitive Emotion Regulation Questionnaire-Short Version (CERQ):** This questionnaire is a self-report tool developed by Garnefski and Kraaij (2006) and contains 18 items. It includes nine cognitive emotion regulation strategies. These strategies include: blame, self-acceptance, rumination, positive re-focus, re-focus on planning, positive re-evaluation, perspective-taking, catastrophe, and blaming others. Questions are answered on a 5-point Likert scale from almost never to almost always. Cronbach's alpha coefficient for the subscales ranged from 0.73 to 0.80 and test-retest reliability coefficients from 0.41 to 0.59. In Iran, Hasani estimated the Cronbach's alpha for the scale from 0.76 to 0.92 and its correlation coefficient from 0.51 to 0.77. Also, the correlation between the subscales was 0.32 [28].

**Checklist for Symptoms of Mental Disorders (SCL-25):** This test is a shortened form of the SCL-90 test developed by Najarian and Davoodi and has been validated at Shahid Chamran University. The reliability of this scale was reported to be 0.97 by internal consistency (Cronbach's alpha) and 0.78 by the test-retest method [29]. The findings of the research by Tanhaye Reshvanloo and saadati Shamir (2015) which was carried out using the exploratory factor analysis supported the 7-factor structure of this tool, and explicated the 82.16% variance. Confirmatory factor analysis also indicated that the seven-factor structure with the foundation pattern was appropriately fitted. There was a significant negative correlation between the SCL-25 subscales and the

dimensions of psychological and social well-being, which indicated appropriate divergent validity of this scale. Cronbach's alpha coefficients were 0.71 to 0.95 and the split-half coefficients were 0.65 to 0.96 for the subscales and the whole test, respectively [30].

Patients aged 15 - 50 years of both sexes who complained about one or more symptoms of allergic rhinitis were selected to participate in the study after receiving a definite diagnosis of rhinitis allergic by an immunologist. Then the demographic and personal data of the individuals were recorded and the purpose and content of the survey was explained to them. Afterwards, the questionnaires were handed out to the individuals by their consent and were analyzed after completion.

### Results

Table 1 presents the means, standard variations and correlative coefficients of the variables in allergic patients.

According to Table 1, there is a significant positive relationship between rumination, re-focusing on planning, and blaming others with the symptoms of mental disorders while this relationship is negative and significant for positive re-focusing and catastrophizing. Also, the results of the research show that positive refocusing strategies, positive reassessment, perspective-taking and catastrophizing have a significant positive relationship with quality of life. There is a significant and negative relationship between quality of life and self-blame, rumination, re-focusing on planning and blaming others. In the next phase, multivariate step-by-step regression was used to examine the proportion of cognitive emotion regulation strategies in explaining symptoms of mental disorders and quality of life in patients with allergic rhinitis.

To use the regression model, it is necessary to test the assumptions of its use. For this purpose, the Camera / Watson test was used to evaluate the independence of the errors, linearity test with two indices of tolerance coefficient and variance inflation factor and Kolmogrov/Smirnov test for normality distribution. In predicting symptoms of mental disorders components, the numerical values of the Camera / Watson test (0.968) and Kolmogrov/Smirnov (0.28) indicated the independence of the errors and the normality of the distribution. The other regression characteristics and linearity assumptions are presented in Table 2.

**Table 1.** The descriptive results and correlative coefficients related to the variables in allergic patients.

Subscale	Mean	Standard deviation	Correlative coefficients	
			Symptoms of Mental Disorders	Quality of life
Self-blame	5.58	1.78	0.554**	-0.225*
Acceptance	5.72	1.66	0.006	0.168
Rumination	5.92	2	0.550**	-0.267**
Positive re-focusing	5.74	1.93	-0.220*	0.320**
Re-focusing on planning	4.18	1.69	0.468**	-0.308**
Positive re-evaluation	6.41	2.15	-0.057	0.291**
View point	5.14	1.69	-0.030	0.182*
Catastrophizing	6.67	1.77	-0.190*	0.296**
Blaming others	4.61	1.85	0.573**	-0.248**
Symptoms of Mental Disorders	50.39	15.03	-	-
Quality of life	80.66	13.75	-	-

\*p<0.05 \*\*p<0.01

The results of Table 2 show that among the nine cognitive emotion regulation strategies, blaming others, self-blame, rumination and positive re-focusing were able to predict the symptoms of mental disorders of patients with allergic rhinitis. In predicting quality of life components from emotion regulation strategies, the numerical values of the Camera / Watson test (2.017) and the Kalmogrov/Smirnov test (0.98) indicated the independence of the errors and the normality of the

distribution. Other features of regression and assumptions of linearity are presented in Table 3.

The linearity indices show that there is no linearity between the predicted variables and the results of the regression model can be reliable. In addition, the results of Table 3 show that among nine cognitive emotion regulation strategies, positive re-focusing, re-focusing on planning and catastrophizing were able to predict quality of life in patients with allergic rhinitis.

**Table 2.** The Regression Characteristics and Linearity Assumptions

Predictive Variables	R	R <sup>2</sup>	df	F	B	Beta	t	Tolerance	VIF
Blame others	0.573	0.328	(123,1)	60.12***	4.64	0.573	7.75	1	1
Blame others	0.686	0.470	(122,2)	54.17***	3.50	0.432	6.14	0.87	1.13
Self-blame					3.38	0.402	5.72	0.87	1.13
Blame others	0.707	0.500	(121,3)	40.27***	2.90	0.358	4.83	0.75	1.32
Self-blame					2.68	0.319	4.22	0.72	1.37
Rumination					1.60	0.215	2.66	0.63	1.57
Blame others	0.727	0.529	(120,4)	33.65***	2.62	0.324	4.41	0.73	1.36
Self-blame					2.74	0.326	4.43	0.72	1.38
Rumination					1.69	0.227	2.87	0.63	1.57
Positive re-focusing					-1.34	-0.173	-	0.97	1.03
							2.72		

\*\*\*p<0.001

**Table 3.** Features of Regression and Assumptions of Linearity

Predictive variables	R	R <sup>2</sup>	df	F	B	Beta	t	Tolerance	VIF
Positive re-focusing	0.320	0.102	(122,1)	13.90***	2.26	0.320	3.72	1	1
Positive re-focusing	0.428	0.183	(121,2)	13.59***	2.11	0.398	3.61	0.99	1
Planning					-2.33	-0.286	-3.46	0.99	1
Positive re-focusing	0.477	0.227	(120,3)	11.76***	1.80	0.255	3.10	0.95	1.04
Planning					-2.17	-0.266	-3.29	0.98	1.01
Catastrophizing					1.68	0.215	2.60	0.94	1.05

\*\*\*p<0.001

## Discussion

The aim of the present study was to predict the symptoms of mental disorders and quality of life of allergic patients based on cognitive emotion regulation strategies to improve the physical and psychological status of these patients.

The results of this study showed that among maladaptive strategies, self-blame, other blame, and rumination have a significant and positive relationship with symptoms of mental health disorders and can predict them significantly [31]. These results are in line with the findings of previous [32-36].

Similarly, in all conducted studies, it has been indicated that adaptive cognitive emotion regulation strategies have a positive association with mental health, and a negative association with maladaptive strategies. However, Sayyah et al. showed that catastrophizing, among adaptive acceptance strategies and maladaptive strategies, was the best predictor of mental health [33]. However, in the present study, self-blame, other-blame, and rumination among the maladaptive strategies, and positive refocusing and planning among adaptive strategies were the best predictors of allergic patients'

mental health. Ongen also showed that maladaptive strategies had a decisive role in predicting depression but findings indicated gender differences; other-blame in women, and self-blame and rumination in men had stronger association with depression [35]. Seligowski et al. investigated the association between emotion regulation and post-traumatic stress disorder syndrome and found similar results. The results of their study revealed that the maladaptive strategy of rumination had a strong association with clinical symptoms of post-traumatic stress disorder [36].

Rumination includes the passive transformation of distress rather than its active deformation [36] and aggravates and continues a negative emotion by enhancing negative thinking, inefficient problem solving, interfering with purposeful behavior, and regulating emotion [37]. In a wrong cycle, rumination results in more dissatisfied self-thought and self-blame, which in turn increases rumination [38].

Self-blame refers to thinking about blaming him/herself about what happened and blaming others refers to thinking about blaming others or the environment for the happened event [32]. Maladaptive cognitive emotion

regulation strategies prevent healthy expressions of emotions. Negative affect in these individuals initiate rumination, which in turn leads to intensification of negative emotions and rumination. Rumination will increase self-blame and other-blame thinking and will eventually lead to physical symptoms.

These researchers found that adaptive emotional regulation strategies had a positive relationship with mental health and its related factors while this relationship is negative and inverse about maladaptive emotional regulation strategies. Emotional regulation played a decisive role in the relationship between stressors and physical health. Elder et al. in developing theories of emotion regulation stated that disturbances in emotions and their regulation due to their natural importance in everyday life would have wide pathological consequences. Difficulty in emotion regulation and using maladaptive emotion regulation strategies are effective and important factors in physical and mental health [39].

In explaining the impact of cognitive emotion regulation strategies on mental health, it can be stated that cognition, affect, and behavior are completely intertwined. Cognitive emotion regulation by controlling attention and cognitive consequences of emotion alters the changing in function of cognitive systems such as memory, attention, consciousness and then emotion regulation. The setting then becomes emotional. Today, contrary to earlier theories, usefulness of emotion is emphasized in behavior. The general viewpoint suggests that emotions occur before behavior and optimize one's adaptation to the physical and social needs. Emotion stabilizes one's state in relation with the environment by coordinating mental, biological and motivational processes [40] and equips the individual with appropriate and efficient responses to problems and leads to one's physical and social survival.

In this regard, the results of the present study showed amongst adaptive strategies, positive refocusing, and planning have significant and positive relationships with quality of life and these strategies can predict life quality significantly. Concerning the predictive role of this strategy, it can be mentioned that this finding is concordant with the results of previous research [33]. Using adaptive positive refocusing strategy allows one to look at the negative events over the positive aspects and the potential benefits of those events in long time, thus experiencing less tension and stress, and more easily dealing with negative events of life. Amongst abnormal strategies, self-blame other-blame, rumination and re-focusing on planning have negative and significant relationships with quality of life. These findings are consistent with the results of previous studies[39]. Similarly, Saklofske et al. investigated the role of emotion regulation ability in coping with stress and academic success and suggested that emotion regulation ability plays a mediating role between stress and life satisfaction. In this context, the results of the present study are in line with those found by Saklofske et al., while this study paid more attention to cognitive emotion regulation strategies [41].

People have high levels of emotion regulation skills (such as positive re-focusing, positive reassessment, etc.) and consider stressful events as a chance and an opportunity for learning rather than a threat to security. As a result, they experience fewer physiological and emotional disorders and naturally have a better quality of life.

Positive emotions and affects lead to a higher perceived self-efficacy, implying the health-related beliefs and the ability to cope. Adaptive emotional skills play an important role in improving physical and mental performances of individuals and emotional regulation plays a crucial role in the relationship between stressors and physical health. Adaptive emotion regulation strategies, as an optimal interaction of cognition and emotion, are needed to deal with difficult situations. People with allergic rhinitis by conscious and active selection of adaptive emotion regulation strategies can modulate immature and excited mental responses to stressful situations. In addition, they can increase the prevalence and deepness of pleasant emotions and promote life quality.

In theoretical levels, the findings of the present study can help to develop the knowledge in this field and provide a background for future research on cognitive emotion regulation strategies and their impact on mental health and quality of life in patients with allergic rhinitis. Practically, considering the significant relationship between cognitive emotion regulation strategies and their impact on psychological health and life quality of these patients, suggest the need for educational interventions based on cognitive emotion regulation strategies and emotional self-regulation in the treatment of allergic diseases.

The present study faced a few limitations such as its sampling which was limited to the patients who had referred to the asthma and allergy clinic of Ghaem hospital in Mashhad city which challenges the generalizations of the results. The other limitation was using self-report tools, which indicates the reports might have been biased. Accordingly, it is recommended that more accurate methods such as structured clinical interviews be used for future researches.

## Conclusion

The results of this study demonstrate the role of cognitive emotion regulation strategies on mental health and quality of life in allergic patients and emphasizes the importance of applying psychological therapies and trainings in addition to medical treatment to regulate the emotions in these patients.

## Conflict of Interest

The authors declare no conflicts of interest.

## Ethical Approval

This research has been approved by the ethics committee of Mashhad University of Medical Sciences and has been registered with the ethics code of IR. MUMS. fm. REC.1396603. In this research all ethical principles were



considered. Participants were assured of the confidentiality of their information and participated in the study with informed consent.

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