

## Original Article



# The beliefs about allergic rhinitis and its treatment options from people in Central Thailand

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## ABSTRACT

**Background:** Allergic rhinitis (AR) has substantially negative impacts on patients' quality of life. Besides conventional medicines, many patients use alternative approaches, which sometimes were misconception.

**Objective:** This study aims to explore and compare the beliefs about AR and its treatment options between 2 different groups; control and AR patient groups.

**Methods:** A cross-sectional study of 518 respondents residing in the central region of Thailand has been conducted using a self-reported questionnaire which consists of 3 parts; personal profile, the International Study of Asthma and Allergies in Childhood (ISAAC) questions, and the beliefs. ISAAC is applied for identifying respondents as the control or the AR group.

**Results:** From a total of 518 respondents, 311 (60.0%) were identified as the AR group. The demographic data between the control and the AR group has no statistical difference ( $p > 0.05$ ). Regarding the beliefs about AR characteristics, 56.1% of the AR group believe that low immunity causes AR while the number of the control group reaches 56%. Thirty-nine point two percent for the AR group and 38.6% for the control group believe that AR is a fatal disease. The belief that AR can be spread by droplet/airborne transmission is 22.8% and 28.5% for the AR and the control group, respectively. About AR treatment options, 60.1% of the AR group and 43% of the control group believe that taking vitamin C can relieve AR symptoms, which has a statistical difference ( $p < 0.05$ ) between the 2 groups. The belief that prolonged use of antihistamine drugs can cause drug resistance is 29.9% and 24.6% for AR and control groups, respectively.

**Conclusion:** Both groups of respondents mostly share common beliefs about AR characteristics and treatment options in which the AR group has higher percentage in some beliefs. Therefore, health literacy should be promoted in order to improve patient's care.

**Keywords:** Allergic rhinitis; Beliefs; Thai

## INTRODUCTION

Allergic rhinitis (AR) is defined as a nasal symptomatic disorder induced by IgE-mediated inflammation after allergen exposure. According to Allergic Rhinitis and its Impact on Asthma definition, clinically defined AR can be clinically defined when 2 or more of the following symptoms has shown—sneezing, nasal obstruction, watery rhinorrhea, or nasal/

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ocular pruritus for over an hour a day within the last 6 months. AR can be classified by frequency (intermittent or persistent) and severity of symptoms (mild or moderate-severe).

AR is a major health problem worldwide. Globally, 400 million people have suffered from AR [1]. For most countries, the prevalence of AR was reported to be 15%–25% [2]. In Thailand, there is no nationwide epidemiologic study about AR. However, several regional studies have been conducted. In 2006, the prevalence of adolescents aged 13–14 years old in Thailand was 21.0% [3]. In 2007 the prevalence of university students in Phitsanulok province was 57.4% [4]. In 2008, the prevalence of adults for AR in Ayutthaya province was 37.7% [5]. In 2014, the prevalence of Thai adolescents, aged 12–14 years old in Bangkok and Pathum Thani province for AR was 45.5% [6].

AR patients have been suffering from the symptoms which have substantially negative impacts on their quality of life. Its symptoms have significant effects on both physical and psychosocial health (emotional, social, school functioning) [6]. There are many aspects of effects on physical health including sleep disturbance (snoring, obstructive sleep apnea, daytime fatigue, learning disabilities and problems at school, poor academic performance, and a decrease in job effectiveness). Furthermore, AR is associated with multiple comorbidities such as sinusitis, asthma, conjunctivitis, eczema [7, 8]. This leads to an increase of medical expense both direct costs; medication, hospital fees, diagnostic testing; and indirect costs; increased absenteeism and reduced productivity [8].

In conventional medicine, antihistamine and intranasal corticosteroid are used as a treatment of choice for AR. Apart from prescribed medication, self-medication is also common, resulting in an under or over medication. The under medication leads to neither treatment efficiency nor a good quality of life while the over medication can cause unnecessary expense and increased morbidity due to multiple side effects [7].

Moreover, several alternative treatment options have been found. For instance, a study in the Philippines found that hydration therapy, fruit juice, and tea are commonly used [9]. In China, Chinese herbs are widely used as a traditional treatment despite the unknown mechanism of action. However, it has been reported in a randomized control trial study that there is no statistically significant difference between receiving Chinese herbs compared with placebo [10]. Therefore, any beliefs might not have actual benefits for patients' health.

Combining researches above, researchers are confident that similar occurrences of such belief toward both conventional and alternative treatments in Thailand are possible. These beliefs presumably have major impacts respectively on patients' adherence to treatment and health outcomes. Nevertheless, substantial knowledge related to the beliefs toward characteristic of AR and its treatment options in Thailand has not been fully established. Hence, this study aims to explore and compare the beliefs about AR and its treatment options between 2 different groups; the AR and the control group.

## **MATERIALS AND METHODS**

### **Respondents**

This study was approved by Human research ethics committee of Thammasat University No.1 (Faculty of Medicine); EC number MTU-EC-SA-1-118/61. A cross-sectional study is applied

in this study which aims to investigate the beliefs about AR and its treatment options from respondents residing in the central region of Thailand. Six public institutes (4 hospitals and 2 offices) in the area were selected in which the permission have been granted. The respondents in each location were randomly selected. The objectives and the methods of this study were explained before obtaining the verbal inform consent from each participant. Data from 518 respondents, aged between 18–80 years old, both with and without AR, was collected. Most respondents are from Pathum Thani (315 respondents), Bangkok (128 respondents), Ayutthaya (46 respondents), Saraburi (9 respondents), Nonthaburi (9 respondents), and others (11 respondents). This survey was conducted from August to December 2017.

### Questionnaire

This quantitative study uses self-report questionnaire survey which consists of 3 parts; respondents' profile, a set of questionnaires the International Study of Asthma and Allergies in Childhood (ISAAC) [11] and newly developed questions regarding the beliefs about AR and its treatment options.

In the first part, respondents' profile part, questions were designed to identify demographic variation such as sex, age, level of education, monthly income, and source of healthcare information.

Questions under the ISAAC part were applied to categorize respondents into either control or AR groups. Thai language questionnaire, translated from the original ISAAC questionnaire by the panel of Thai pediatric allergists [12], has previously been used for both Thai children and adults AR assessment [4-6, 13-15]. Respondents with the symptoms that follow the ISAAC's criteria were identified as the AR group. In contrast, respondents who were not classified as the AR are called the control group. Within AR group, the respondents were divided by severity of the symptoms; mild, moderate, and severe. The frequency of the symptoms, intermittent and persistent, has also been used to divide the respondents. Moreover, the additional questions regarding the recognition of their AR symptoms and management have also been presented.

Questions under the third part, the beliefs about AR characteristic and treatment options, were newly designed and developed by the researchers in order to indicate both groups of respondents' beliefs in each aspect. The questions were modified from previous studies about AR characteristic and treatment options [10, 16-25]. The questions consist of 2 parts. The first 9 questions relate to the beliefs about AR characteristics and the next 21 questions ask about the beliefs in AR treatment options. Thai language was used throughout the study for both verbal and written communication. A pilot test was conducted in 50 respondents prior to the study.

### Data collection and analysis

After verbal consent, each respondent answered the printed self-report questionnaires. A list of 518 respondents was separated into 2 groups, the control and the AR group. To ensure the accuracy of the data, 50% of the respondents' data were randomly checked. Descriptive statistics was applied for this study and compared between the 2 groups. Data was encoded into IBM SPSS Statistics ver. 23.0 (IBM Co., Armonk, NY, USA). In order to investigate the differences of demographic data (**Table 1**) between the AR and the control group, described in frequency and percentage, the chi-square test was applied to the questionnaire data. The

**Table 1.** Demographic data

Variable	Control (n = 207)	AR (n = 311)
Age (yr)	40.28 ± 13.61	37.60 ± 12.18
Sex		
Male	57 (27.6)	106 (34.1)
Female	150 (72.5)	205 (65.9)
Education level		
Uneducated	1 (0.5)	2 (0.6)
Primary school	11 (11.11)	18 (5.8)
Secondary school	34 (16.43)	51 (16.4)
Vocational certification	23 (11.1)	33 (10.7)
BA	94 (45.4)	161 (51.8)
MA-PhD	32 (15.5)	46 (14.8)
Income in USD per month		
<300	43 (20.8)	50 (16)
301-500	56 (27.1)	78 (25.1)
501-1,000	54 (26.1)	100 (32.2)
>1,000	54 (26.1)	83 (26.6)

Values are presented as mean ± standard deviation or number (%).

AR, allergic rhinitis; BA, bachelor of arts; MA, master of arts; PhD, doctor of philosophy; USD, United States dollar.

**Table 2.** Severity, frequency, and recognition of the allergic rhinitis (AR) symptoms and the respondents' management toward the disease.

Variable	Number (%) (n = 311)
Severity	
Mild	218 (70.1)
Moderate to severe	93 (29.9)
Frequency	
Intermittent	273 (87.78)
Persistent	38 (12.21)
Recognition of AR symptoms	
Not recognize	150 (48.2)
Recognize	160 (51.4)
Management	
Untreated	186 (59.8)
Treated	125 (40.2)
Self-medication	56 (18.0)
Prescribed medication	77 (24.8)

age data, displayed in mean and standard deviation formats, however, was analyzed using the 2-sample *t* test method. In the AR group, the frequency, severity, and recognition of the respondents' AR symptoms along with their management (**Table 2**), described in frequency and percentage form, was analyzed using the *Z* test. The chi-square test was applied to identify the differences of the beliefs about AR characteristics and its treatment options between the AR and the control group (**Figs. 1, 2**), which were described in both frequency and percentage form. A *p* value of <0.05 is identified as a level of significant differences between the AR and the control group.

## RESULTS

From a total of 643 respondents, 518 questionnaires were completed and analyzed (80.5% completion rate). The demographic data between control and AR group has no statistical difference (*p* > 0.05). The respondents are from widely distributed education level and income. Most respondents are from the central region of Thailand including Pathum Thani, Bangkok, Ayutthaya, Saraburi, and Nonthaburi provinces. While the majority of the

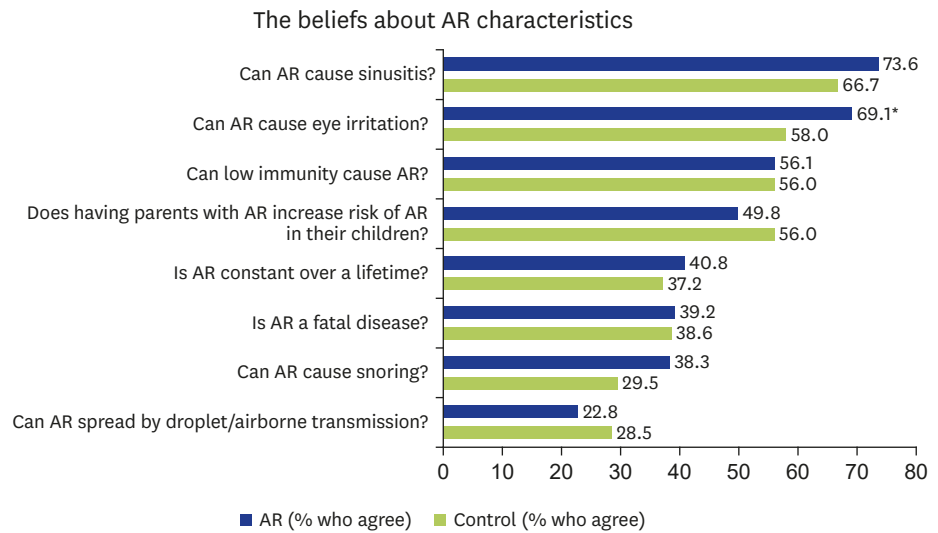


Fig. 1. The beliefs about allergic rhinitis (AR) characteristics. \* A *p* value of <0.05 from the chi-square test.

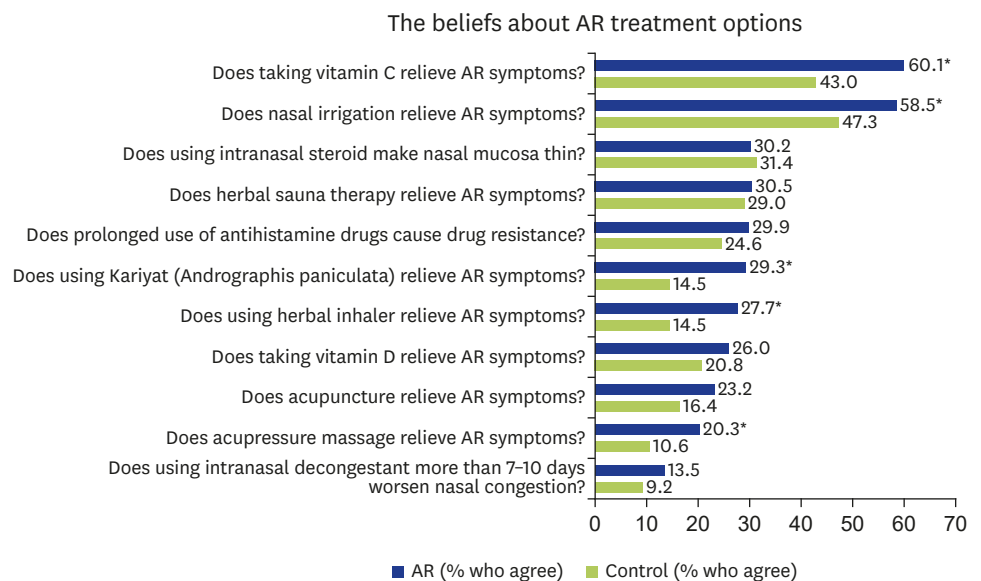


Fig. 2. The beliefs about allergic rhinitis (AR) treatment options. \* A *p* value of <0.05 from the chi-square test.

respondents received health information from the internet, hospital, television, friends, and family, respectively, primary health care unit and radio are less popular. The demographic data of the respondents is shown in **Table 1**.

Among the AR group, most respondents (70.1%) are identified as mild for the severity of the symptoms, whereas 87.78% are identified as intermittent for the frequency of the symptoms. Only 51.4% of the AR group recognize their AR symptoms and only 40.2% were treated. The information about severity, frequency, and recognition of AR symptoms as well as their management are shown in **Table 2**.

**Fig. 1** portrays the respondents' beliefs about AR characteristics. The highest percentage of the respondents in both AR and control group believe that AR can cause sinusitis. The

numbers reach up to 73.6% and 66.7%, respectively. 69.1% of the AR group believe that AR can cause eye irritation while the percentage of the control group is at 58%, which has a statistical difference ( $p < 0.05$ ) between the 2 groups. The percentage of the respondents who believe that low immunity causes AR are almost the same for both the AR group and the control group, which are 56.1% and 56%, respectively. Regarding the belief that AR is a fatal disease, 39.2% of the AR group and 38.6% of the control group agree with the idea. Only 22.8% of the AR group and 28.5% of the control group believe that AR can be spread by droplet/airborne transmission.

The beliefs about AR treatment options are shown in **Fig. 2**. While 60.1% of the AR group believe that taking vitamin C can relieve AR symptoms, only 43% of the control group believe in the same idea. There is a statistical difference ( $p < 0.05$ ) between the 2 groups. Fifty-eighty point five percent of the AR group and 47.3% of the control group believe that nasal irrigation can relieve AR symptoms. There is also a statistical difference ( $p < 0.05$ ) between the 2 groups. The percentage of the respondents who believe that using intranasal steroid can cause nasal mucosa thin is 30.2% and 31.4% for the AR and the control groups, respectively. The percentage of the AR group who believe that prolonged use of antihistamine drugs can cause drug resistance is at 29.9% whereas the percentage of the control group is at 24.6%. The percentage of the respondents who believe that using a herbal inhaler can relieve AR symptoms is 27.7% and 14.5% for the AR and the control groups, respectively, which has a statistical difference ( $p < 0.05$ ) between the 2 groups. Regarding the belief that acupressure massage can relieve AR symptoms, 20.3% of the AR group and 10.6% of the control group agree with the idea which has a statistical difference ( $p < 0.05$ ) between the 2 groups. Only 13.5% and 9.2% of the AR group and the control group respectively believe that using intranasal decongestant continuously more than 7–10 days can worsen nasal congestion.

## DISCUSSION

The prevalence of AR in this study is 60% which is consistent with the recent studies conducted in 2007 [4], 2008 [5], and 2014 [6] at 57.4%, 37.7%, and 45.5%, respectively. The ratio seems to be rising from the latest studies. It can be assumed that as the data collection was performed in nonhospital base setting, most of the respondents in the AR group have mild severity. Because of that, almost 50% of the AR group do not recognize their symptoms as AR and almost 60%, therefore, was not treated. It is possible that they do not consider the AR as the cause of the symptoms and remain suffering from those symptoms which reduce their quality of life.

This is a pioneering study to explore and compare the beliefs between the 2 different groups, the AR and the control group. The result above indicates that overall, both groups have similar beliefs about AR characteristic such as AR symptoms; sinusitis and snoring. The idea that sinusitis could be a consequence of AR gained the highest percentage especially in the AR group which could be a result of having more experience about the disease. However, the control group also has a good level of knowledge about the symptoms. The belief about eye irritation, in contrast, is significantly different presumably because the symptom is not so obvious. Hence, the percentage of the respondents in the control group who believe in this idea is less than in the AR group. More than half of the respondents believe that AR is caused by having low immunity. Because of how the disease is named in Thailand, people are confused that the cause of AR comes from not having enough immunity and try to increase

it. Approximately 40% believe that AR is a fatal disease which leads to an unnecessary over-concern. Some respondents believe that AR can be spread by droplet/airborne transmission as its symptoms are similar to a common flu so people assume that it can be transmitted in the same way, though the air. In fact, a pathogenesis of AR cannot be transmitted by human.

Regarding the beliefs about treatment options, most respondents believe that taking vitamin C can relieve AR symptoms. Between the 2 groups, the AR group has a statistically significant higher percentage of the respondents who agree with the idea as compared to the control group. However, a cross-sectional study of 547 adults in Germany found that vitamin C has no association with AR by studying the plasma level of antioxidant nutrients such as vitamin C [22]. The result is similar to a previous study in Thai adults with AR which compared rhinitis symptom between the “aerobic exercise only” group and the group that aerobic exercise and also take the vitamin C supplement [17]. This study supports the idea that AR is not related to vitamin C. It is possible that people who think AR is caused by having low immunity perceive that it can relieve AR symptoms. Nasal irrigation is the second most believed ideas, proposing nasal irrigation helps to improve the AR symptoms. The idea is supported by a previous study that performed the randomized controlled trials (RCTs) to compare AR symptom severity between patients, both adults and children, who use nasal saline irrigation to those who did not use. The result showed that using nasal saline irrigation can reduce the severity of the disease without reported side effects [20]. Around one-third of respondents in both groups believe that using intranasal steroid can cause nasal mucosa thin. However, a previous study shows that intranasal steroid is considered as a safe and effective therapy. Common local side effects of intranasal steroid are dryness, stinging and burning of nasal mucosa and sneezing. Septal perforation can also occur, rarely, which can be avoided by applying the agent in a right technique [19]. Believing that using intranasal steroid can make nasal mucosa thinner reduce patients' compliance which leads to ineffective treatment.

A quarter of the respondents in the AR group and one-fifth of the control group believe that vitamin D can relieve AR symptoms. The route of this could be an uncommon usage of vitamin D in Thailand and its benefits are rarely mentioned. Around one-fifth of respondents believe that vitamin D can relieve AR symptoms. Tian and Cheng [16] reviews several studies about the role of vitamin D in AR. Both experimental and clinical studies show that vitamin D is either positively or negatively associated with AR which require a further study to strengthen the idea. Herbal has long been used in Thailand as one of a healing tools and its usage has been developed into various methods such as an herbal sauna and an herbal inhaler. According to the result in this study, approximately 30% of the respondents in both groups believe that herbal sauna can relieve AR symptoms. A previous study [23] in Thailand has conducted a RCT to find out the efficacy of adding herbs in a steam bath to AR patients. The result shows no difference between the steam bath alone and the steam bath with herbs, yet both treatments can largely improve AR symptoms.

Another usage of herbs is an inhaler in which there is a difference of the percentage between the AR group and the control group, 27.7% and 15%, respectively. Even though the study about an herbal inhaler has never been done in Thailand, a study about herbal preparation is found in China [10]. The tablet (RCM-102) consists of 8 types of herbs which individually inhibit the release of the key inflammatory mediators related to seasonal AR. Despite the safety of taking the tablet, the result is indifferent from taking a placebo. It is worth considering that herbs used in Thai and China might be different which provide vary outcomes.

Only 23.2% of the AR group and 16.4% of the control group believe that acupuncture relieves AR symptoms. A systematic review [18], recently conducted in China about the acupuncture's efficacy in the treatment of AR conclude that acupuncture therapy has a comparable effect to other medications. Even though the acupuncture is a traditional Chinese medicine, it is considered as an alternative treatment which is not widely used in Thailand. This could be the reason why only a small amount of people agreed with the idea in both groups.

The result above shows that there are only a small group of people who believe that the acupressure massage can relieve AR symptoms. Two systematic reviews [24, 25] in China conducted in 2008 and 2017 were presented. Nevertheless, both studies are found to have unreliable conclusion on account of and inefficient amount of available trials, high risk of bias, and poor quality of the sources.

Despite the fact that a prolonged use of topical nasal decongestants more than 7–10 days can cause rhinitis medicamentosa, also known as rebound congestion [26], in this study, only a few people believe in the issue. The consequence could be the side effects from using the agent improvidently.

The 2 remaining beliefs which have not been supported by any study include the prolonged use of antihistamine can cause drug resistance and the alternative treatment of using Kariyat. The first one can lead to poor compliance and reduce quality of life which in fact it does not have such effect. The latter's result has not been confirmed which leads to a waste of financial resource.

From the statistic calculation, there are some beliefs in which the percentage of people in the AR group agree with the idea, statistically significant, more than the percentage of people in the control group. However, some of the beliefs got proven to be less efficacy as an AR treatment or the strong evidence has not been found. It is possible that the AR group have tried various methods of treatments in order to cure themselves which can lead to unnecessary expenses. Therefore, health literacy should be promoted to improve patients' care.

There are several limitations to be addressed in this study. A sample group, to begin with, was not covered a nationwide and was not selected randomly. Thus, it may not represent the belief of Thai population as a whole. Nevertheless, thanks to a large amount of the sample size, it could represent the belief of population in the central region of Thailand. Secondly, respondents categorized as the AR group were diagnosed by using only ISAAC questionnaire which typically overestimate the prevalence of AR [27]. Whereas, physicians practically use skin prick test for the definite diagnosis. The number of the AR group, hence, may be exaggerated. Lastly, since the questions about the belief were modified from several previous studies and some common beliefs in Thailand, it may not cover all aspects of beliefs.

Our study represents an initial and fundamental data for AR prevalence of population in central region of Thailand to be compared with both past and future studies. Further studies are recommended to be done with a larger sample size, use a randomized sampling method, and conduct not only in community-based but also hospital-based setting. Regarding the beliefs, future studies are suggested to apply a wider range of aspects in order to achieve more extensive results.

In conclusion, the prevalence of AR in this study is considerably large. Both groups of respondents mostly share common beliefs about AR characteristics and treatment options



in which the AR group have higher percentage in some beliefs. After all, the physicians can utilize the strength and overcome the limitations of the patients' care.

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