

## Family Medicine Approach to Allergic Rhinitis with Biopsychosocial Triggers

### Rhinitis Alergi dengan Faktor Pencetus Biopsikososial berdasarkan Pendekatan Ilmu Kedokteran Keluarga

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#### ABSTRACT

Allergic rhinitis (AR) is an allergic response that causes varied symptoms in the nose by exposure to allergens. A patient with a family history of atopy has a higher risk of AR. Various trigger factors can trigger the allergic response. Symptoms disturb daily life activity, decrease productivity, and cause many complications if left untreated. This case was found in primary health care in Malang city. Complete history-taking was done to identify the risk factors, and then some home visit was done to identify the trigger factors. The patient was a woman with a history of atopy. Trigger factors found came from the environment, but there is a possibility that the trigger factor is psychological pressure. This case report will discuss the role of family medicine and its application in allergic rhinitis. Comprehensive and holistic management is needed because of the complex relationship between biopsychosocial factors with AR.

**Keywords:** Allergic rhinitis, trigger factor, psychological factor, atopy, family medicine, biopsychosocial

#### ABSTRAK

Rhinitis alergi merupakan suatu respon alergi yang menyebabkan sekelompok gejala yang bervariasi pada hidung, karena adanya paparan dari alergen. Penderita dengan riwayat keluarga atopi lebih berisiko memiliki rhinitis alergi. Terdapat berbagai macam faktor pencetus yang dapat mencetuskan respon alergi tersebut. Rhinitis alergi dapat menyebabkan gangguan pada aktivitas harian dan menurunkan produktivitas karena gejala yang ditimbulkannya, dan menyebabkan berbagai komplikasi bila dibiarkan. Kasus ini ditemukan dari fasilitas kesehatan layanan primer di Kota Malang. Anamnesis dilakukan secara mendalam untuk mengidentifikasi faktor risiko, kemudian dilakukan kunjungan rumah dan tempat kerja pasien untuk mengidentifikasi faktor pencetus. Penderita pada kasus ini merupakan wanita dengan riwayat atopi. Faktor pencetus berasal dari lingkungan, tetapi juga terdapat kemungkinan bahwa pencetusnya berupa tekanan psikologis. Pada laporan kasus ini akan dibahas bagaimana peran dan penerapan kedokteran keluarga pada kasus rhinitis alergi. Penanganan komprehensif dan holistik diperlukan karena keterkaitan faktor biopsikososial yang kompleks pada rhinitis alergi.

**Kata Kunci:** Rhinitis alergi, faktor pencetus, faktor psikologis, atopi, kedokteran keluarga, biopsikososial

## Introduction

Allergic rhinitis (AR) is an inflammatory process of the nasal mucosa due to a hypersensitivity type 1 response. This disease is often found in people worldwide, and its prevalence has increased significantly in the last three decades. Patients with this disease are estimated to be 25% of children and 40% of adults, with 80% of symptoms appearing before the age of 20 years, and peaking at the age of 20-40 years, then followed by a reduction in symptoms. The prevalence of AR is higher in children and women in adulthood (1).

A study in Budapest regarding the risk factors and comorbidities of AR showed that atopic diseases, such as asthma, food allergies, and eczema, were significantly associated with an increased risk of AR, where asthma was the most significant comorbidity. A family history of atopy is a significant risk factor for RA. Environmental factors where individuals who live more than five years in urban areas have an increased risk of AR compared to individuals who live in urban areas for less than five years. Air pollution from factory smoke, vehicle exhaust, and cigarette smoke is a significant risk factor for AR sufferers (2).

Complications caused by AR include chronic rhinosinusitis, which nasal polyps can accompany. Complications can occur in the ear due to eustachian tube dysfunction, which causes otitis media with effusion. Approximately 10-40% of allergic rhinitis progresses to asthma, especially in persistent moderate-severe RA (3). Not only that, RA also impacts the quality of life of sufferers. In 2018 a systematic review stated that 3.6% of adult patients had to be absent from work, and 36% felt their work performance was disrupted due to AR, which indirectly affected the family's economy (3). Research in Iran showed that most AR sufferers felt a reduced quality of life due to symptoms that interfere with sleep and waking. The study proved 146 participants; 38% felt their quality of life was mildly affected, and 62% felt their quality of life was greatly affected by AR. Patients with intermittent severe AR mainly experience decreased quality of life. The severity of AR tends to affect sufferers' physical and mental condition. The more severe the AR, the lower the quality of life (4).

Family medicine provides continuous and comprehensive health services for individuals and families. It integrates biological, clinical, behavioral factors, and covers all ages, genders, organ systems, and diseases (5). This case report discusses how AR from a family medicine perspective. Suppose other medical specialties focus on the part of the body, disease, and treatment techniques. In that case, family medicine focuses more on the individual without separating physical and psychological conditions so that it is not limited to any health problem, and the endpoint of the health service cannot be determined. The context of disease must be understood, especially in diseases that cannot be fully understood if one does not know the patient's personal, family, social, and environmental conditions, such as AR (6). The role of the family is also crucial for individuals, from the side of family medicine, because there is a possible genetic link. The family plays an essential role in the development of a person from childhood, susceptibility to certain diseases, and the spread of infectious diseases, and influences morbidity, mortality, and recovery. It can be concluded that a person's health is greatly influenced by family life. On the other hand, the family is affected by diseases or health conditions of family members (6). This comprehensive health service aims to provide treatment holistically so that health status and quality of life can be improved. Not only disease management but also helping patients to prevent and understand their disease, as well as directing the patient's health goals. Thus the care provided can improve the health system by providing cost-effective health services (7).

## Case

### Anamnesis

Forty-five-year-old woman, Muslim, Javanese ethnicity, graduated from high school, currently works as

a street vendor of batagor dumplings. The patient came to the primary care clinic in early August 2022. It was the patient's first visit to the primary health facility. Patients complain of colds that have not gone away since about 20 years ago. A transparent and liquid snot discharge accompanies a runny nose, often dripping suddenly from the right or left nose, and does not stop. Complaints appear mainly in the morning and evening or when it is cold. Complaints disappear when the patient goes to work or walks in the sun. Cold complaints accompany nasal congestion, itchy nose, sneezing, and watery eyes. Complaints are felt every day, do not disturb sleep or work, but interfere with daily activities, such as praying or cooking at home. Other complaints were denied, such as decreased olfactory function, nosebleeds, smelly nose, facial pain, fever, and the color of the snot turning yellow. Regarding this condition, the patient had never been treated before. Efforts that have been tried include nerve massage and the consumption of herbal medicine. The patient received cetirizine from the clinic.

In addition, patients often feel shortness of breath and wheezing since around 2000, especially at night, with a frequency of about three times a week. Shortness of breath disappeared when the phlegm was successfully removed. Sputum was challenging to expel, and phlegm was white. In 2018, she was taken to the emergency room 2 times and received steam therapy because of shortness of breath, so she could not sleep and felt that she could breathe after being hunched over. Shortness of breath worsens after the patient cleans the dusty house. The patient had a history of egg allergy from childhood until 2000—allergic reactions such as itching and rashes all over the body. Sometimes the face and lips also swell. Apart from that, there are no other complaints from other body systems.

The patient is the last child of 5 siblings. The patient's mother had a history of hypertension and died in 2018 due to a hemorrhagic stroke. The patient's father has a food allergy which causes itching all over the body. The patient's father also had a history of vomiting blood and died in 2001 during intestinal surgery. The patient's first sister, a 58-year-old woman, has a history of molar pregnancy. The second brother, a 53-year-old male, was a heavy smoker. The third brother, a 51-year-old male, has a history of lipoma. The fourth brother, a 50-year-old male, had polio, encephalitis, and epilepsy. The patient has a 46-year-old husband and two children. The first child, a 20-year-old girl, has a seafood allergy and an allergy to cold air. The second child is a 16-year-old boy. The patient lives at the house with her husband, children, and her second, third, and fourth siblings. The house belongs to the family, and the patient has lived with his parents since childhood. The house is located by the river, narrow but long. Air ventilation is minimal, and doors and windows are only at the front and back of the house. A wooden divider separates the room where the patient's nuclear family lives and the room where her siblings live. The house felt damp, dusty, and dim. The patient does not use a mask at home, including when cleaning the house.

If the river water overflows, sometimes the water will also flood the patient's house.

Every day the patient starts his activities at 3 am to cook and prepare his wares. The patient and her husband worked together at 10 am until the merchandise ran out. Then they sleep at 7 pm after clearing their wares. The location for work is on the side of a road often passed by motorized vehicles. Patients always wear a mask when working. On Sundays, the patient does not work and participates in gymnastics or a healthy walk with a gymnastics community. Patients usually cook their meals for the family every day. The patient never consumes cold drinks because they feel triggered by a cold. Patients often make their own herbal medicine, such as a decoction of lemon grass, lime, ginger, turmeric, and honey is added if they want a sweet taste.

The patient is the youngest child but must be the head of the family. The patient complains that his relationship with his siblings is not good. Her first sister seldom stays in touch with the patient even though her house is close to hers. Her older brothers are unemployed, so the patient has to pay for the household's daily needs. The patient does household activities such as cooking and cleaning the house. Her second brother sometimes works as a massage therapist.

In contrast, her fourth sister is currently challenging to communicate with. She has memory problems and finds it difficult to carry out daily activities without the help of others. The patient's fourth sibling has had seizures since elementary school, and until now, he still has frequent twitching seizures with a duration of more than 10 minutes, and each seizure is only massaged or left alone. Because of this condition, the patient also cared for his older brother. Patients feel they do not have the right to express opinions; for example, in matters of health, the patient's older siblings feel they do not need the help of medical personnel and rely more on nerve massage or treatment from a healer. The patient's older siblings still believe that the disease experienced by the patient's fourth sister resulted from witchcraft. Related to the death of the patient's mother, the patient also complained that if the patient's mother was immediately taken to the hospital when she had symptoms of a stroke, maybe the patient's mother could still recover. However, at that time, the patient's older siblings opposed his wish to take his mother to the hospital and only received a nerve massage. The patient herself and her husband had just taken care of BPJS and were using it for the first time.

While the patient's relationship with her husband and children is good, the patient's first child is currently studying statistics in the fourth year, and the patient's second child attends a state high school. The patient's relationship with the neighbors is also good. The patient's husband is the deputy head of the local RT.

#### Physical Examination

A physical examination was conducted two weeks after the patient's first visit to the clinic.

Complaints during the examination were colds that had not healed even though they had used cetirizine from the clinic. On physical examination, everything was normal except for a runny nose discharge (Table 1).

#### Family Assessments

The patient lives at home with her husband, two children, and three older brothers. Then the form of this family was an extended family. Based on Duvall's eight-stage family life cycle, the patient's family stage was at stage V (Family with teenagers), where the first child was 20 years old. The family APGAR score was used to determine how the family functions according to the patient, and a score was 10, which means that the family function was good (Table 2). Next, we assess the family's ability to seek health services and deal with crises with the SCREEM family, which we summarize in Table 3. Meanwhile, the family coping score in this family was four because the family participates minimally in patient health efforts, with limited abilities from an economic standpoint. Moreover, limited knowledge about the patient's condition, thus requiring encouragement and direction on what can be done to help the patient.

**Table 2. Family APGAR score**

No	Question	Often (2)	Sometimes (1)	Rarely (0)
1	I am satisfied because I can ask for or get help from my family when I have a problem.	✓		
2	I am satisfied with the way my family consults to solve problems.	✓		
3	I am satisfied because I was given the opportunity to grow in the direction of life that I wanted.	✓		
4	I am satisfied with the affection that exists between my family.	✓		
5	I am pleased with how my family divides their time between private and shared activities.	✓		

## Discussion

#### Holistic Diagnosis

Holistic diagnosis in the family medicine approach was carried out by examining five aspects, namely personal aspects, biomedical aspects, internal risk aspects, external risk aspects, and functional aspects. The personal aspect is an aspect that looks at the patient's perception of the disease. In this case, the patient came to the clinic to try using BPJS for the first time with complaints of a cold that had not healed since 20 years ago. The patient suspects that the complaint is an allergy and is worried that there are polyps in his nose. Efforts made by the patient are avoiding cold air and cold drinks, basking in the hot sun, and consuming herbs. The biomedical aspect is based on patient complaints and the doctor's examination results. This patient was diagnosed with moderate to severe persistent allergic rhinitis, with a differential diagnosis of non-allergic rhinitis such as

vasomotor rhinitis, drug-induced rhinitis, and non-allergic rhinitis with eosinophilia syndrome. Internal risk aspects in this patient include a history of food allergies in the patient's father, which may be genetically inherited; the biological condition of the patient who has a history of food allergies and has experienced an acute asthma attack; the psychological condition of the patient who feels pressured by his obligation to provide for the family, take care of all the housework, and take care of his sick older brother; as well as the patient's habit of not wearing a mask when cleaning the house, and the wrong way of cleaning the house causes dust to fly. As for the external risk aspect, from family factors, the patient's older siblings, who live at home with the patient, do not participate in managing the household and are very dependent on the patient. One of the patient's older siblings is a heavy smoker. The patient is often exposed to vehicle fumes and street dust from the work environment factors. From the living environment, the patient's house is close to a river, so the air is humid; the shape of the house is narrow and elongated, with little ventilation and lots of furniture, which is quite dusty. Functional aspects are classified into five functional degrees. The patient's functional degree is 1, in which the cold he complains of is quite disturbing to daily activities. However, the patient can still carry out daily activities independently before getting sick, and this complaint does not interfere with the patient's work.

## Diagnostic

### Enforcement Analysis

Allergic rhinitis is a health problem often encountered and is related to other allergic conditions such as atopic dermatitis, food allergies, conjunctivitis, and asthma. Allergic rhinitis is usually a long-standing condition but is rarely detected in primary care settings and often overlooked by patients (8). Severe and chronic allergic rhinitis can interfere with work and sleep and reduce the quality of life. Based on its etiology, rhinitis can be divided into IgE-mediated rhinitis, allergic rhinitis, non-allergic rhinitis, and rhinitis due to infection. Non-allergic rhinitis includes vasomotor rhinitis, work-related rhinitis, drug-induced rhinitis, and hormonal rhinitis. Vasomotor rhinitis resembles allergic rhinitis but is caused by an imbalance in the autonomic system. Psychological factors and environmental factors such as dust, smoke, humidity, temperature changes, and cold air trigger vasomotor rhinitis (8).

The diagnosis of allergic rhinitis can be made from anamnesis regarding the patient's history and physical examination. However, we need to do an allergy test to find out the cause of the allergy. The diagnosis of allergic rhinitis is made when there are more than 1 of the following classic symptoms for more than 1 hour on most days: rhinorrhea, nasal congestion, continuous sneezing, and itchy nose, with or without conjunctivitis. Allergic salute), clear liquid secretions, mucosal edema and pallor, and turbinate hypertrophy. Eyes may reveal allergic

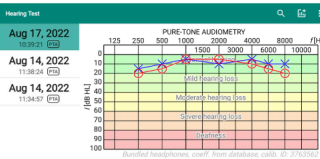
shiners, eyelid edema, and a cobblestone appearance on the palpebral conjunctiva. On examination of the ear can be found retraction of the tympanic membrane and the presence of otitis media with effusion. In addition, geographic tongue and cobblestone appearance can also be found on the posterior pharyngeal wall (8).

**Tabel 3. Family SCREAM**

	Resource	Pathologis
Social	The patient lives at home with his three older brothers. The patient's older sister lives near the patient's house.	The patient is not on good terms with his older sister. The patient's fourth brother is unable to carry out daily activities independently, while the other patient's older brother does not care about the condition of the patient's fourth brother, so the patient has to take care of his fourth brother. The patient's second and third siblings do not help the patient even though they are at home, so the patient has to prepare food for his older siblings and clean the house, and sometimes his older siblings ask the patient for money.
	The patient has many dumping and batagor customers. The patient knows his neighbors well, both at home and at his bussiness location.	
Cultural	Javanese culture is still quite attached to the patient.	Patients more often use massage services and healers ("smart people") when a family member is sick.
		The patient and his older siblings have lived together in the family home since they were young; therefore, his older siblings still have rights over the house even though they don't take part in managing it.
Religious	The patient prays and recites the Quran consistently. The patient thinks that by doing so, he will be blessed in numerous ways.	The patient still believes that his fourth brother fell ill because he was bewitched by bad people. The patient believes that if he is diligent in taking care of his fourth older brother and leaves prayers for his fourth older brother, who is still healthy and is a good person, the patient will get good luck.
		There are many patient expenses, so those secondary needs are still quite difficult. The patient has to support the people in the household, totaling 7 people. Because of this condition, patients almost never go to health facilities.
Economic	The patient has a permanent job, namely as a street vendor. The merchandise runs out every day. Income per month ranges from IDR 3,000,000.00 to IDR 5,000,000.00.	There are no pathological conditions.
Education	The education level of the patient and her husband is Senior High School. Patients understand enough health information and can accept new information well.	The patient has never seen a doctor before because of cost issues.
Medical	The patient has just made BPJS and has only used it once. The patient's house is not far from the location of the health facility.	

**Table 1. Physical Examination**

Item	Organ	Parameter	Examination Result	Interpretation
Nutritional states		Body Height	153 cm	Normal
		Body Weight	50 kg	
		IMT	21,4 kg/m <sup>2</sup>	
		Abdomen circumference	78 cm	
General States		General States	Mild illness	
		Awareness	Compos mentis, GCS 456	
Vital sign		Blood Pressure	130/72 mmHg	Normal
		Oxygen Saturation	98% room air	
		Cardiac Rate	75 x/minute	
		Respiratory Rate	18 x/minute	
		Axillar Temperature	36,4 °C	
Head to toe	Head		Normocephal	Alergic sign (+)
		Pupil	Round Isokor 3 mm/ 3 mm	
		Anemia Conjunctiva	-/-	
		Ichteric Sclera	-/-	
		Cobblestone appearance	-/-	
		Allergic shiners	+ / +	
	Neck	Lymphnode Enlargement	-	Normal
		Tyroid Enlargement	-	
	Pulmo	Chest wall motion	Symmetric	Normal
		Development of chest wall	Symmetric	
			N   N	
		Stem fremitus	N   N	
			N   N	
		Percution	Sonor   Sonor Sonor   Sonor Sonor   Sonor	
		Breath Sound	Vesicular   Vesicular Vesicular   Vesicular Vesicular   Vesicular	
		Rhonki	-/- -/- -/-	
		Wheezing	-/- -/-	
			Not visible	
	Cordis	Ictus cordis	Palpable at ICS V MCL S	Normal
		Heart sound	S1 S2 regular single	
		Murmur	-	
	Abdomen	Gallop	-	Normal
		Abdomen sound	Soefl + (normal)	
		Mass	-	
	Extrimity	Scar	-	Normal
			Warm acral	
		Capillary refill time	<2 second	
		Edema	-	
		Cyanosis	-	
		Lesion	-	

Local Examination	Auricle	Edema	-/-	Normal
		Congenital Fistula	-/-	
		Pain	-/-	
	Canalis acusticus externus	Hiperemia	-/-	Normal
		Edema	-/-	
		Stenosis	-/-	
		Furuncle	-/-	
		Fistula	-/-	
		Discharge	-/-	
		Granulation	-/-	
		Polyp	-/-	
		Colesteatoma	-/-	
		Foetor	-/-	
		Cerumen	-/-	
	Tympanic membrane	Color	Intact/Intact	Normal
		Pulsation	Normal/Normal	
		Cone Reflex	-/-	
Tunning Fork Examination 512 Hz		Rinne	+/+	Normal
		Weber	No lateralisation	
		Schwabach	Normal/Normal	
Hearing Screening with Application			Hearing threshold right ear : 7,5 dB Hearing threshold left ear : 8,75 dB	Normal
Nose Examination	Outer Nose	Deformity	-/-	Normal
		Hematome	-/-	
		Crepitation	-/-	
		Pain	-/-	
		Sinus pressure pain	-/-	
	Vestibulum	Edema	-/-	Normal
		Discharge	-/-	
		Mass	-/-	
	Nasal cavity		Wide/Wide	Hypereactif
		Mucosa	Normal/Normal	
		Hyperemia	-/-	
		Mass	-/-	
		Discharge	Watery/Watery	
		Conchae edema	-/-	
		Conchae hyperemia	-/-	
		Septum deviation	-/-	
Neck Examination	Oral Cavity	Nasal floor	Normal/Normal	Normal
		Palatum molle phenomenon	+/+	
		Trismus	-/-	
		Ulcer	-/-	
		Lip movement	Normal/Normal	
		Teeth	Normal/Normal	
		Tongue	Normal	
		Palatum	Normal/Normal	
	Tonsil	Uvula	In the middle/In the middle	Normal
		Size	T1/T1	
		Hyperemia	-/-	
		Detritus	-/-	
	Pharynx	Crypt	Normal/Normal	Normal
		Pseudomembran	-/-	
		Hyperemia	-/-	
		Ulcer	-/-	
		Parese	-/-	Normal
		Granule	-/-	
		Pseudomembrane	-/-	



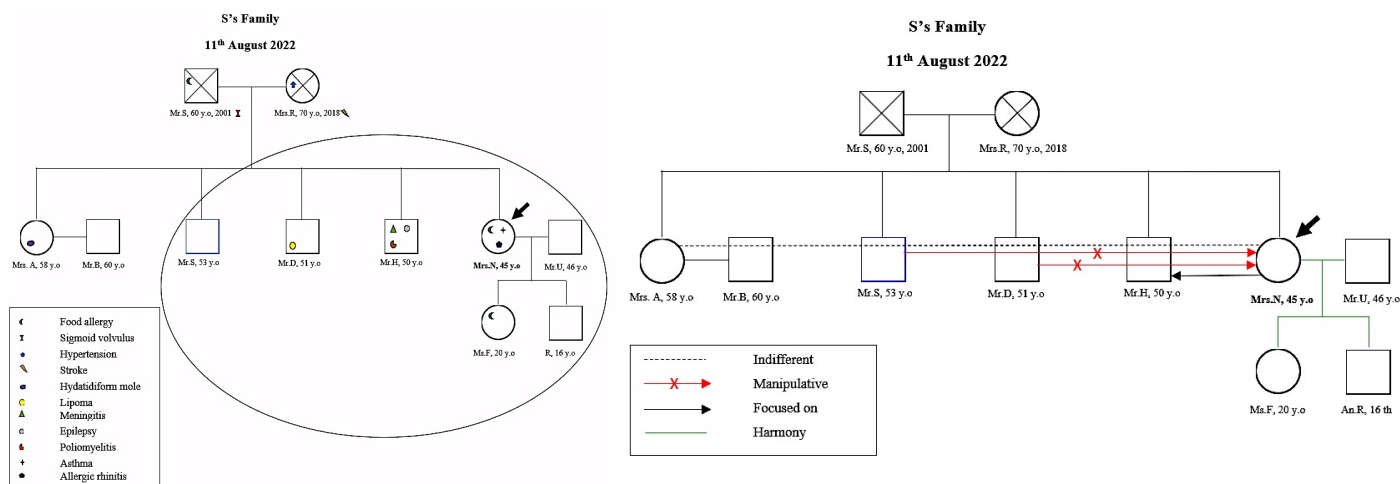
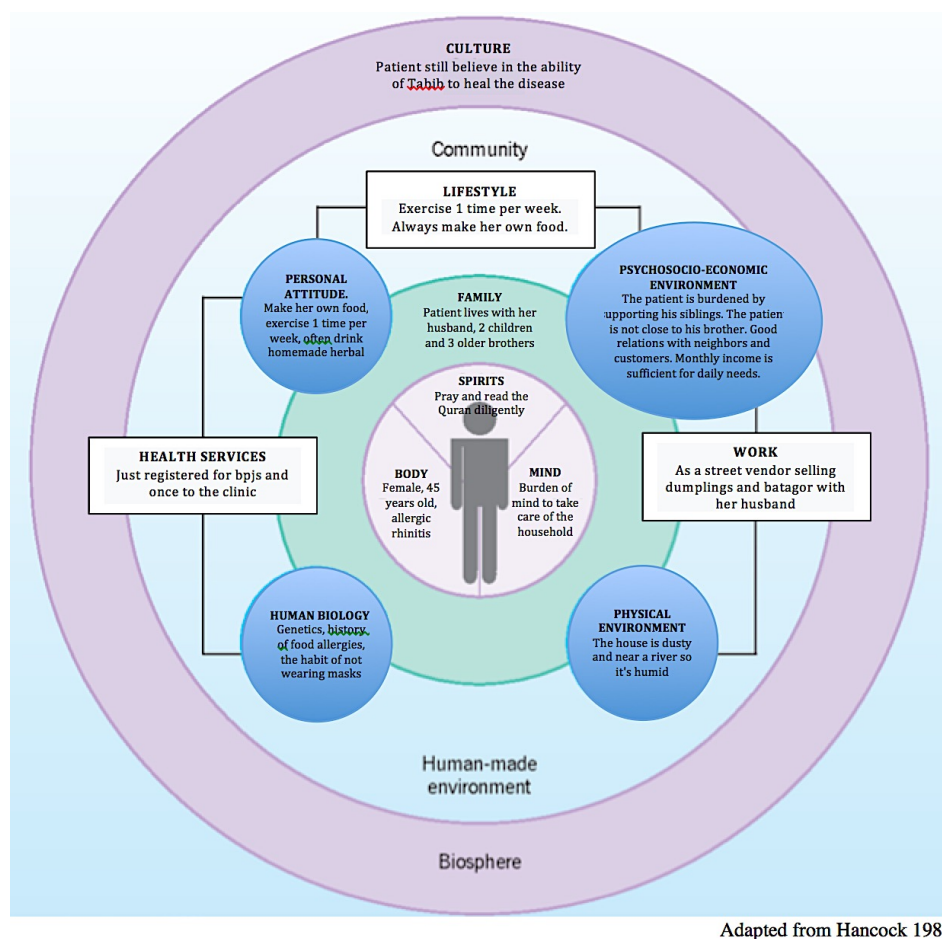


Figure 1. A. Family Genogram. The S family genogram shows familial relationships and disease history. Arrows denote the locations of patients. An active smoker is indicated by a box with a blue border. The large oval shows the people who live in the same house as the patient. A cross indicates that the person has deceased (Left picture). B. Family Emotional Relations The genogram of the S family above shows the emotional relationship of the S family members to the patient. Patients are indicated by arrows (Right picture).



**Figure 3. The Mandala of Health**  
The Mandala of Health summarizes the factors that affect the patient's health (18).

**Table 4. Allergic Rhinitis Classification**

Based on Symptom Duration	
Intermittent	Persistent
Symptoms <4 consecutive days/week or <4 consecutive weeks	Symptoms ≥4 consecutive days/week and already ≥4 consecutive weeks
Based on Degree of Severity	
Mild	Moderate-Severe
No disturbance of sleep, no disturbance of daily activities/exercise/leisure, no disturbance of work/school, the symptoms that appear are not disturbing	There is one of the disturbances of sleep, disturbance of daily activities/exercise/leisure, disturbance at work/school, the symptoms appear very bother

(ARIA guideline 2019)

Patients have complained of colds for years, with clear liquid secretions, which mainly appear in the morning and evening. Complaints are accompanied by continuous sneezing, itchy nose, and itchy eyes. These complaints correspond to the symptoms of allergic rhinitis. The patient experiences this almost every day, and it is sufficient to interfere with activities so that it can be classified as moderate-severe persistent allergic rhinitis.

In addition to the findings of typical signs and symptoms, exploring the risk factors and trigger factors in diagnosing allergic rhinitis is necessary. Risk factors for allergic rhinitis include a family history of atopy and a history of exposure to formula foods or cigarette smoke in the first year of life (10). Precipitating factors come from the environment, such as pollen, animal hair, textiles, cigarette smoke, dust, a humid environment, and cold air (8). This patient is known to have a family history of atopy; the patient's house is damp and dusty, and exposure to cigarette smoke supports the onset of allergic rhinitis.

Allergy is a disease related to biopsychosocial. Psychological factors are believed to trigger the allergic process. Several studies have shown a two-way relationship between psychosocial factors and allergies. Depression, anxiety, and mental stress, especially chronic stress, are related to allergies through links between the nervous, endocrine, and immune systems. Autonomic nerves. Stress modulates the immune response through the psychoneuroimmunoendocrine and hypothalamic-pituitary-adrenal (HPA) pathways. The corticotropin-releasing hormone controls stress reaction's emotional, habitual, and physiological components. The release of glucocorticoids from the hippocampus influences the intensity and duration of HPA axis reactions to stress. Emotional distress directly affects the inflammatory process due to the chronic upregulation of proinflammatory cytokines, which trigger allergies. Through the combination of cytokines and glucocorticoids, there is a reciprocal interaction between the immune and central nervous systems. There is a

change in the function of this interaction which is the origin of the pathology (12). A study by Harter et al. in 2019 showed that there was a positive relationship between anxiety and seasonal allergies and between depression and perennial allergies (11). Another study by Huang et al. in 2022 showed that depression positively correlated with sneezing and production of mucoid discharge, anxiety is positively correlated with itchy nose and congestion, psychosis is positively correlated with itchy nose and sneezing, and other psychological disorders such as sleep disturbances are positively correlated with congestion and production of mucoid discharge (13). This supports the theory that psychosocial factors related to allergies. Therefore, it is also suspected that the allergic rhinitis experienced by patients can originate from their psychosocial factors. When viewed chronologically, the symptoms of allergic rhinitis appeared 20 years ago, which means a year since the death of the patient's father. Since then, it may be the patient who should replace the head of the family. Only now, the attitude of the patient's older siblings has remained the same, and the patient has not found a solution to overcome the psychological stress he is facing. In addition, patients experience allergy symptoms only when they are at home.

Allergic rhinitis does not only affect the nose locally but also involves all components of the airways, which have many physiological, functional, and immunological connections between the upper respiratory tract (nose, nasal cavities, paranasal sinuses, eustachian tubes, pharynx, and larynx) and lower airways (trachea, bronchi, bronchioles, and alveoli). Allergens can provoke a local inflammatory response in the upper and lower respiratory tract, so it is not uncommon to find asthma in allergic rhinitis sufferers.

Not only that, this patient had a history of being taken to the emergency room twice because of severe shortness of breath, so he could not sleep and had to sit in a bent position to breathe. Patients also complain of frequent wheezing, especially at night. This is an asthma symptom, but to establish the diagnosis, it is necessary to do a lung function examination to prove the variability of the expiratory airflow limitation.

Asthma is a variable disease characterized by a history of respiratory symptoms such as wheezing, shortness of breath, and coughing that vary in time and intensity; and variability in expiratory airflow limitation. To establish the diagnosis of asthma, it is necessary to have a history of respiratory symptoms (wheezing, shortness of breath, coughing), which vary in time and intensity, usually appear at night or when you wake up, can be triggered by exercise, laughter, allergens, and cold air, and symptoms worsen when viral infection occurs; and there is evidence of limited expiratory airflow variability, as determined by the FEV1/FVC (14).

This patient experienced an allergic march, in which the patient had a history of urticaria and angioedema when consuming eggs, then allergic rhinitis occurred, and she also had asthma symptoms. Allergic march or atopic march is a clinical course of atopic



manifestations. The course of allergic disease sequentially starts with atopic dermatitis and food allergies, which can start in infancy and gradually develops into allergic asthma and allergic rhinitis. In this phenomenon, some will gradually disappear with age, but some will continue for years. Several preventive measures to inhibit the clinical course of an allergic march include avoiding triggers and treating symptoms with antihistamines, glucocorticoids, desensitization, and targeted therapy (15).

### Comprehensive Intervention

Intervention is carried out comprehensively according to the holistic diagnosis obtained. Comprehensive interventions include patient-centered, family-focused, and community-oriented interventions. Patient-centered interventions are tailored to 5 aspects of the diagnosis.

- On the personal aspect, education is carried out regarding the course of allergic diseases experienced by patients and their complications, the characteristics of allergies that can be prevented by avoiding trigger factors, and long-term treatment, as well as conducting home visits to identify risk factors in the living environment and workplace. In addition, patients deserve appreciation for their efforts to start using BPJS and to see a doctor.
- On the biomedical aspect, the patient was diagnosed with moderate-severe persistent allergic rhinitis, with an allergic VAS rating of 5/10. The primary therapy is in the form of non-pharmacological therapy, namely by avoiding trigger factors, such as: protecting oneself from cold temperatures, not consuming cold drinks, avoiding house dust, cleaning the house with a damp mop and cloth, so dust does not fly, and taking medication from a doctor according to instruction. Initial therapy with intranasal corticosteroids should be given for the pharmacological treatment of VAS 5 persistent allergic rhinitis. However, because intranasal corticosteroids were not available in primary health facilities, oral anti-H1 was given, which is also the first-line therapy for allergic rhinitis. Oral anti-H1 drugs available at primary health facilities, for example, cetirizine 10 mg, are taken once a day. VAS evaluation was carried out after three days. Then it is measured again whether there is improvement or worsening of the VAS. If the VAS improves, you can continue the previous therapy or do a step-down. If the VAS worsens, a step-up is performed and re-evaluated after three days. If it still does not improve, we can be referred to an ENT specialist (16).
- On the aspect of internal risk, education is provided that allergy is a disease related to genetics, and it is explained that conditions of psychological stress can trigger rhinitis.
- On the external risk aspect, a family conference is offered. Family conferences provide opportunities for patients and family members to express feelings or difficulties experienced which affect health. 6 Family

conferences bring together all family members who live at home to discuss treatment plans that involve patients. 5 Families need to be motivated to alleviate House chores. Meanwhile, the patient's older siblings need to be educated to quit smoking and not depend entirely on the patient's finances. Regarding workplace environmental factors, patients are educated to keep wearing masks while working to avoid smoke or dust that can irritate the airways.

- On the functional aspect, efforts are made to ensure that patients' functional degree and quality of life-based on VAS do not get worse with prevention and treatment.

Family-focused interventions involve the family as the client because of the importance of addressing each family member when caring for a family member who needs health care. This intervention is expected to help each family member adapt, accommodate, and use household resources to achieve the whole family's welfare (17). It is necessary to educate patients' older siblings about the importance of health services that are increasingly accessible with the existence of BPJS. Regarding the seafood allergy the patient's daughter has, education is needed that this condition may be genetically related and can be prevented by avoiding allergen-causing foods. It is important to remember that food allergy conditions can progress to allergic rhinitis and asthma if proper prevention and treatment are not taken. The patient's family still believes that massage can cure all diseases, so education is needed that not all diseases can be cured by massage because it has nothing to do with it medically. For the patient's older sibling with epilepsy and impaired brain function, it is necessary to explain that this condition requires medical assistance to find out the cause of the disease and be treated so that the quality of life improves.

## Conclusion

Allergic rhinitis, which appears to be a simple disease, has a complex relationship with the patient's biopsychosocial factors. So a comprehensive diagnosis is needed to find out the triggering factors because the primary treatment of allergic rhinitis is to avoid the trigger factors. Allergic rhinitis is not a disease that can be cured quickly. Holistic and sustainable management is needed to control the symptoms, so they do not interfere with daily activities or work.

## Acknowledgment

The author would like to thank to all the contributors to this article.

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