

Prevalence of herbal medicines in patients with chronic allergic disorders in Western Saudi Arabia

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ABSTRACT

الأهداف: لتقييم مدى انتشار ونمط استخدام أدوية الأعشاب من قبل مرضى الحساسية في المنطقة الغربية، المملكة العربية السعودية.

الطريقة: استخدمت دراسة مستعرضة وجمعت بيانات من مرضى اضطرابات الحساسية المزمنة المعينين على التوالي خلال الفتره من يوليو 2018م إلى أكتوبر 2018م. قمنا بمقابلة مشاركون من عيادات الحساسية بجدة بشكل مباشر مع المرضى واستخدام استبيان منظم.

النتائج: أجرينا مقابلة مع 102 من المرضى الذين يعانون من الحساسية. كان متوسط أعمارهم 34 ± 18 عام وشكل الأناث 72.5% من العينة. كان التشخيص الأكثر شيوعاً التهاب الأنف التحسسي (24.5%)، التهاب الجلد (19.6%)، والربو الشعبي (16.7%). تم استخدام الأدوية العشبية بنسبة 60% من المشاركين، بما في ذلك: حبة البركة (19.6%)، يانسون (12.7%)، شجرة اللبان (11.8%)، الزنجبيل (10.8%)، الشمر (9.8%)، الجوافة (9.8%)، الزيتون (8.8%)، الزعتر (5.9%)، البابونج (4.9%)، النعناع (4.9%)، القرنفل (4.9%)، وأعشاب أخرى. من بين هؤلاء، ذكرت 63% من العينة تحسن في الأعراض. وظهر ترابط قوي بين الربو واستخدام أدوية الأعشاب ($p=0.001$).

الخاتمة: بالرغم من عدم كفاية الأدلة، أظهرت نتائج الدراسة ارتفاع معدل انتشار استخدام أدوية الأعشاب من قبل مرضى الحساسية (أكثر من النصف) وخاصة في الربو الشعبي. الحبة السوداء واليانسون واللبان كانت الأكثر استخداماً.

Objectives: To assess the prevalence and pattern of the use of herbal medicines by allergic patients in Western Kingdom of Saudi Arabia.

Methods: Cross-sectional study design was used to collect data from consecutively recruited patients with chronic allergic disorders from July 2018 to October 2018. Participants from 2 allergy clinics in Jeddah, Kingdom of Saudi Arabia were interviewed face-to-face using a structured questionnaire.

Results: One hundred and two patients with allergy were interviewed. Their average age was 34 ± 18 and 72.5% were female. The most common primary diagnoses were allergic rhinitis (24.5%), atopic dermatitis (19.6%), and bronchial asthma (16.7%). Herbal medicines were used by 60% of participants, including: *Nigella sativa* (19.6%), *Pimpinella anisum* (12.7%), *Boswellia sacra* (11.8%), *Zingiber officinale* (10.8%), *Foeniculum vulgare* (9.8%), *Psidium guajava* (9.8%), *Olea europaea* (8.8%), *Thymus vulgaris* (5.9%), *Matricaria chamomilla* (4.9%), *Mentha piperita* (4.9%), *Syzygium aromaticum* (4.9%), and others. Of those, 63% reported subjective improvement in symptoms. A significant association was found between asthma and herbal medicines intake ($p=0.001$).

Conclusion: Despite the insufficient evidence, there was a high prevalence of herbal medicines used by allergic patients (more than half), especially in bronchial asthma. Black seed, anise and olibanum were the most commonly used.

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Allergy is defined as immunological hypersensitivity that can lead to a variety of different diseases via different mechanisms. Allergy may be presented in the form of various different conditions such as anaphylaxis, allergic rhinitis, allergic asthma, conjunctivitis, urticaria, angioedema, atopic dermatitis (eczema) as well as food

or drug-induced hypersensitivity reactions.¹

The prevalence of some allergic conditions is high in different regions of Kingdom of Saudi Arabia (KSA). The prevalence of asthma among Saudi adults in KSA was 4.1% according to a national household survey in 2013.² The prevalence of allergic rhinitis in children in KSA was 26.51% according to an epidemiological survey in 2004.³ In Riyadh, KSA, the prevalence of rhinitis was 43.8% and physician-diagnosed asthma was 19.6% among 16-18 years old adolescents.^{4,5} In Medina, KSA, a survey of primary school children found a history of eczema in 10.3%, rhinitis in 24.2% and asthma in 23.6% of the surveyed population.⁶ In Taif, KSA, the most prevalent allergic conditions among the studied population were urticaria (70.2%), allergic rhinitis (52.8%), atopic dermatitis (76.3%), and asthma (73.4%).⁷

Because of the chronicity of some allergic conditions and often the lack of a cure, patients tend to use complementary and alternative medicines (CAM), including herbal medicines, to achieve better control of symptoms.⁸ Both national and international studies reported the use of CAM among patients with allergic conditions with variable prevalence rates.⁹⁻¹⁹

Apparently, patients are using different herbal medicines for allergic diseases across the globe. However, in the Western region of KSA, there is limited documentation of herbal medicines usage among allergic patients. Therefore, this study aimed to explore the prevalence and pattern of herbal medicines used by patients with different allergic conditions in Jeddah, KSA.

Methods. A cross-sectional survey was used to collect data from consecutive patients with allergic conditions attending outpatient allergy clinics. The study location was at King Abdulaziz University Hospital and Dr. Samir Abbas Medical Centre in Jeddah, KSA. The study protocol was approved by the ethical committee of King Abdulaziz University Hospital in Jeddah, KSA.

The inclusion criteria was that of every participant who had confirmed diagnosis of any chronic allergic condition by an allergist. Verbal consent was obtained from them after explanation of the study prior to recruitment. Participation in the study was voluntary. Participants were interviewed by the principal investigator using a structured questionnaire of 3

parts in Arabic language exploring the prevalence, pattern and type of herbal medicines for their allergic condition. Epidemiological data was also collected. The questionnaire included 3 parts and was validated after a pilot trial on 20 patients.

Sample size was estimated to be 96 using the simple formula,²⁰:

$$n = \frac{z^2 p(1-p)}{d^2}$$

The values of the parameters used in the formula were $z=1.96$, $p=0.5$, and $d=0.1$. Data analysis was conducted using Statistical Package for Social Science (SPSS) Version 25 (IBM Corp., Armonk, NY, USA). The results presented as mean (standard deviation) or frequency (percentage) as appropriate. To calculate significant associations, the Pearson's chi-squared test was applied with a significance level of $p<0.05$.

Results. One hundred and seven patients were interviewed. Five patients were excluded because they did not meet the inclusion criteria. One hundred and two surveys were successfully completed. The age of the survey respondents ranged between 2-83 years old and the mean age was 34 ± 18 years old. Their weight ranged from 3-115 kilograms and the mean weight was 62 ± 23 kilograms. Their gender was 72.5% females and 27.5% males. More than half of the participants were from the Makkah region (60.8%), which includes Jeddah city (36%), Makkah city (18%), and Taif city (4%), KSA. The patients' level of education varied from illiterate (3.9%) to school education (34.3%), undergraduate degree (49%) and postgraduate degree (12.7%). Other demographic characteristics of the surveyed participants were summarized in Table 1.

The statistical analysis of demographic data with the use of herbal medicines showed a significant association in male gender (75% used herbal medicines) ($p=0.031$) compared to female gender (51% used herbal medicines). Additionally, there was a significantly lower usage of herbal medicines in undergraduates (46% used herbal medicines) ($p=0.018$) compared to other levels of education collectively (69% used herbal medicines) as shown in Table 1.

About one quarter of the participants were primarily diagnosed with allergic rhinitis (24.5%) followed by atopic dermatitis (19.6%), bronchial asthma (16.7%), chronic urticaria (11.8%), allergic rhinosinusitis (11.8%), food allergy (8.8%), allergic conjunctivitis (3.9%), and drug allergy (2.9%) as shown in Table 2.

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Table 1 - Demographic characteristics of participants and association with using herbal medicines (N=102).

| Characteristics | n (%) | Herbal medicines users n (%) | P-value |
|---------------------------|-----------|------------------------------|---------|
| Age (Mean±SD) | 34±18 | | |
| Weight (Mean±SD) | 62±23 | | |
| Gender | | | |
| Male | 28 (27.5) | 21 (75) | 0.031 |
| Female | 74 (72.5) | 38 (51) | |
| Nationality | | | |
| Saudi | 90 (88.2) | 52 (57) | 0.971 |
| Non-Saudi | 12 (11.8) | 7 (58) | |
| Region of origin | | | |
| Makkah | 62 (60.8) | | |
| Medina | 9 (8.8) | | |
| Albaha | 5 (4.9) | | |
| Aseer | 3 (2.9) | | |
| Jizan | 6 (5.8) | | |
| Najran | 2 (1.9) | | |
| Riyadh | 5 (4.9) | | |
| Outside of KSA | 10 (9.8) | | |
| Level of education | | | |
| Illiterate | 4 (3.9) | 3 (75) | 0.478 |
| School | 35 (34.3) | 23 (65) | 0.245 |
| Undergraduate | 50 (49.0) | 23 (46) | 0.018 |
| Postgraduate | 13 (12.7) | 10 (77) | 0.136 |
| Employment | | | |
| Employed | 44 (43.1) | 27 (61) | 0.531 |
| Unemployed | 58 (56.9) | 32 (55) | |

SD - standard deviation.

The chi-squared test used for significance at the level of $p < 0.05$.

The results of this study indicated that 70.6% of participants heard about herbal medicines used in allergic diseases. More than half of the participants (57.8%) used herbal medicines in an attempt to control their allergic disease. The prevalence of the use of herbal medicines was highest in patients primarily diagnosed with bronchial asthma (94%). Herbal medicines were used by more than half of the participants with the primary diagnoses of allergic rhinitis (52%), atopic dermatitis (60%), allergic rhinosinusitis (58%), and drug allergy (66%). Whereas, half or less than half of the participants primarily diagnosed with allergic conjunctivitis (50%), food allergy (22%), and chronic urticaria (42%) used herbal medicines as shown in Table 2. Nearly 63% of herbal medicines users noticed a subjective improvement in their disease symptoms following their intake of herbal medicines. Interestingly, there was a significant association between only patients with bronchial asthma and their usage of herbal medicines ($p=0.001$).

Among all respondents, the most commonly used herbal medicines were black seed (*Nigella sativa*) (20%), anise (*Pimpinella anisum*) (13%), olibanum (*Boswellia*

sacra) (12%), ginger (*Zingiber officinale*) (11%), fennel (*Foeniculum vulgare*) (10%), guava (*Psidium guajava*) leaf (10%), olive (*Olea europaea*) oil (9%), thyme (*Thymus vulgaris*) (6%), chamomile (*Matricaria chamomilla*) (5%), peppermint (*Mentha piperita*) (5%), clove (*Syzygium aromaticum*) (5%), turmeric (*Curcuma longa*) (4%), costus (*Saussurea lappa*) (4%), sidr (*Ziziphus spina-christi*) (3%), myrrh (*Commiphora myrrha*) (3%), Ivy (*Hedera helix*) (3%), sesame (*Sesamum indicum*) oil (3%). The detailed list and pattern of herbal medicines used among specific groups of patients with different primary allergic conditions were presented in Table 3.

Discussion. The most important finding in this cross-sectional study was the high prevalence of use of herbal medicines among a population of allergic patients in the Western region of KSA. Participants used these plants in an attempt to improve their disease condition based on traditional knowledge of the community. In comparison to national and international studies, the rates of using herbal medicines in allergic conditions were higher in our findings. In Central KSA, a cross-sectional study on asthmatics in Riyadh, found that 34.5% of them used different types of CAM including 15% used herbal treatments.²¹

In Norway, a questionnaire study reported the use of CAM, among atopic dermatitis (51.1%).¹⁵ In the United Kingdom, a questionnaire study on children with atopic dermatitis found that CAM, including herbal medicines, were used by 46% of patients.¹⁴ In the United States of America, a survey of patients with atopic dermatitis found that 50.4% used CAM.²² In Germany, an epidemiological study found that nearly 30% of allergic patients reported usage of CAM.¹³ In Ireland, 42.5% of pediatric patients with atopic dermatitis used CAM.²³ In Turkey, herbal medicines were employed by 33.5% dermatology outpatients including eczema (5.5%), and urticaria (3.2%).¹¹ A survey study on asthmatics in the United States of America found 25.4% of patients reported herbal medicines usage.⁹ In Malaysia, the prevalence of CAM among asthmatic patients was 61.1% and herbal medicines were consumed by 16.9% of CAM users.¹² Moreover, a survey of children with poorly controlled asthma in the United States of America found that approximately 34% used CAM including 12.8% herbal medicines.¹⁸ Also in Turkey, a questionnaire for allergic rhinitis found that 37.3% of the patients reported usage of herbal medicines.²⁴ Additionally, the prevalence of CAM use among American children with eczema was found to be 46.9%, according to the 2007 National Health Interview Survey in the United States of America.¹⁷ In Japan, 19.2% of adults and 7.1% of

children patients with allergic rhinitis experimented with CAM.¹⁰ Unexpectedly, males were found to be significantly associated with the use of herbal medicines in this study. Compared to other findings in the literature, conflicting results are reported. The percentage of women who used CAM were slightly higher, but not significant, than men in 3 studies of different allergic conditions.^{11,13,24} However, females were significantly associated with CAM usage in 2 studies of asthmatic and allergic rhinitis patients.^{10,12}

Table 2 - The frequency of each allergic primary disease and patients used herbal medicines.

| Type | Allergic disease | Patients used herbal medicines | P-value |
|-------------------------|------------------|--------------------------------|---------|
| Allergic rhinitis | 25 (24.5) | 13 (52) | 0.496 |
| Atopic dermatitis | 20 (19.6) | 12 (60) | 0.828 |
| Bronchial asthma | 17 (16.7) | 16 (94) | 0.001 |
| Chronic urticaria | 12 (11.8) | 5 (42) | 0.378 |
| Allergic rhinosinusitis | 12 (11.8) | 7 (58) | 0.971 |
| Food allergy | 9 (8.8) | 2 (22) | 0.023 |
| Allergic conjunctivitis | 4 (3.9) | 2 (50) | 0.746 |
| Drug allergy | 3 (2.9) | 2 (66) | 0.753 |

Values are presented as number and percentage (%).
The Chi-squared test used for significance at the level of $p < 0.05$.

Interestingly, herbal medicines were significantly used by bronchial asthma patients compared to other allergic conditions in this study. This indicates that asthma patients in the studied population are seeking alternative treatments because they remain sub-optimally controlled despite the availability of conventional treatments. This is consistent with other studies that reported the difficulty of asthma control partly due to medication-related issues.^{25,26}

In patients with asthma (as a primary diagnosis), the most common plants were olibanum (*Boswellia sacra*), followed by black seed (*Nigella sativa*), anise (*Pimpinella anisum*), and guava (*Psidium guajava*). Although black seed (*Nigella sativa*) was also the most common in a group of asthmatics in the Central region of KSA, different plants were commonly used including myrrh (*Commiphora myrrha*), Garlic (*Allium sativum*), and Fenugreek (*Trigonella foenum-graecum*).²¹

In patients with allergic rhinitis (as a primary diagnosis), the most common plants were black seed (*Nigella sativa*) followed by anise (*Pimpinella anisum*), guava (*Psidium guajava*), ginger (*Zingiber officinale*) and thyme (*Thymus vulgaris*). However, other international studies reported other herbal medicines used in allergic rhinitis except for guava (*Psidium guajava*). Allergic rhinitis patients in Japan used Ten-Cha (*Rubus suavissimus*), Cameleon plant tea (*Houttuynia cordata*),

Table 3 - The pattern of herbal medicines used among each allergic primary diseases.

| Herbal medicines | Allergic conditions | | | | | | | | |
|--|---------------------|------------------|-------------------|-------------------------|--------------|--------------|-------------------|-------------------------|---------|
| | Allergic rhinitis | Bronchial asthma | Atopic dermatitis | Allergic conjunctivitis | Drug allergy | Food allergy | Chronic urticaria | Allergic rhinosinusitis | Overall |
| Black seed (<i>Nigella sativa</i>) | 24 | 47 | 5 | 25 | 0 | 11 | 8 | 17 | 20 |
| Anise (<i>Pimpinella anisum</i>) | 16 | 41 | 0 | 0 | 0 | 11 | 0 | 8 | 13 |
| Olibanum (<i>Boswellia sacra</i>) | 4 | 53 | 0 | 25 | 0 | 0 | 0 | 8 | 12 |
| Olive oil (<i>Olea europaea</i>) | 4 | 0 | 30 | 0 | 33 | 0 | 0 | 8 | 9 |
| Fennel (<i>Foeniculum vulgare</i>) | 8 | 29 | 5 | 0 | 0 | 11 | 8 | 0 | 10 |
| Guava (<i>Psidium guajava</i>) | 12 | 35 | 5 | 0 | 0 | 0 | 0 | 0 | 10 |
| Ginger (<i>Zingiber officinale</i>) | 12 | 29 | 0 | 0 | 0 | 0 | 0 | 25 | 11 |
| Chamomile (<i>Matricaria chamomilla</i>) | 8 | 17 | 0 | 0 | 0 | 0 | 0 | 0 | 5 |
| Turmeric (<i>Curcuma longa</i>) | 0 | 0 | 5 | 0 | 0 | 0 | 8 | 17 | 4 |
| Peppermint (<i>Mentha piperita</i>) | 4 | 6 | 0 | 0 | 0 | 11 | 0 | 17 | 5 |
| Sidr (<i>Ziziphus spina-christi</i>) | 0 | 0 | 15 | 0 | 0 | 0 | 0 | 0 | 3 |
| Myrrh (<i>Commiphora myrrha</i>) | 4 | 0 | 0 | 0 | 33 | 0 | 0 | 8 | 3 |
| Clove (<i>Syzygium aromaticum</i>) | 4 | 23 | 0 | 0 | 33 | 0 | 0 | 0 | 5 |
| Costus (<i>Saussurea lappa</i>) | 0 | 12 | 5 | 0 | 0 | 0 | 0 | 8 | 4 |
| Ivy (<i>Hedera helix</i>) | 4 | 6 | 0 | 0 | 33 | 0 | 0 | 0 | 3 |
| Thyme (<i>Thymus vulgaris</i>) | 12 | 17 | 0 | 0 | 0 | 0 | 0 | 0 | 6 |
| Sesame (<i>Sesamum indicum</i>) oil | 4 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 3 |
| Others | 8 | 30 | 35 | 50 | 0 | 0 | 8 | 0 | 0 |

Values represented as a percentage.

guava tea (*Psidium guajava*), Japanese green tea (*Camellia sinensis*), Japanese persimmon tea (*Diospyros kaki*), Gymnema tea (*Gymnema sylvestre*), Shiso (*Perilla frutescens*), and other herbal teas and juices.¹⁰ In addition, stinging nettle (*Urtica dioicath*), black elderberry (*Sambucus nigra*), and spirulina were commonly used among allergic rhinitis patients in Turkey.²⁴

In patients with dermatological allergic disorders (including atopic dermatitis and chronic urticaria as a primary diagnosis), the most common plants found were olive (*Olea europaea*) oil followed by sidr (*Ziziphus spina-christi*). Compared to other studies, herbal medicines were used in allergic skin conditions but were poorly described.

The anti-allergic effects of some commonly used plants were supported by preliminary evidence. Black seed (*Nigella sativa*) and its active metabolites showed immunomodulatory, anti-inflammatory, anti-histaminic and anti-leukotrienes effect.²⁷ The anti-allergic effect of olive (*Olea europaea*) oil or its extract revealed via anti-histaminic immunomodulatory and anti-inflammatory effects.²⁸⁻³¹ The extract of guava leaves (*Psidium guajava*) had anti-inflammatory and anti-histaminic activities.³² Ginger (*Zingiber officinale*) extract and its metabolites showed antiallergic potential via immunomodulatory, anti-inflammatory, anti-histaminic, anti-leukotrienes and anti-hexosaminidase B activities.³³⁻³⁵ Turmeric (*Curcuma longa*) extract and its active constituents had anti-allergic activity due to the anti-inflammatory, immunomodulatory and anti-histaminic activities.³⁶⁻³⁹ Olibanum (*Boswellia spp*) is also known for its anti-allergic effects, especially for asthma via multiple mechanisms including anti-inflammatory, immunomodulatory, anti-leukotriene and expectorant activities.^{40,41} However, stronger clinical studies are needed for evidence-based use of herbal medicines in allergy.

Study limitations. The main limitation of this study is the small sample size (n=102) which represented a specific population in KSA. Hence, the findings of this study cannot be generalized to all allergic patients. Also, verification of the plant species used by the participant was difficult.

In conclusion, herbal medicines were a common treatment option among allergic patients (more than half) in the Western region of KSA. In particular, patients with bronchial asthma appeared to be the greatest users of herbal medicines due to the difficulty of disease control. Black seed, anise and olibanum were the most widely used herbal medicines among the surveyed group of allergic patients. Most of the reported herbal medicines in this study used based on

traditional knowledge and have preliminary evidence for anti-allergic effects. Therefore, more high-quality clinical trials are required to enhance the rational and safe use of such plants. In the future, research for the attitude, behaviour and factors related to the use of herbal medicines among the allergic population is recommended.

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