

# Awareness of the Unaizah populations in Al-Qassim province in Saudi Arabia regarding nasal decongestant use for allergic rhinitis and their side effect

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## ABSTRACT

**Background:** Nasal decongestant drugs are widely used as potent vasoconstrictive agents to reduce congestion of nasal and ocular mucous membranes in disease such as allergic rhinitis. These drugs are easily accessible to the people over the counter without prescription. The ease in access may lead the population in believing that the drugs are risk free and free from side effects. The purpose of this study was to determine the level of awareness of the people in Unaizah Al-Qassim province in Saudi Arabia on the use of nasal decongestants and their side effects. **Methodology:** After gaining the Institutional Review Board (IRB) approval, the study was a questionnaire-based cross-sectional study conducted on the people Unaizah Al-Qassim province in Saudi Arabia. It was explorative in nature as such a study has never been done in Unaizah before and hence descriptive statistics was mainly used to establish significance and reference. The questionnaires assessed the demographical characteristics of the population, participants' history on the usage of nasal decongestants, health condition of the participants, and knowledge on nasal congestion and use nasal decongestants. **Results:** Out of 385 participants, 54% were male and 46% are female. With regards to age, majority of the participants were between the age of 20 and 40 years 56%, followed by 40–60 years old (33%). 79% of the participants had acquired a baccalaureus level in education. When assessed on the usage of nasal decongestants, 32.5% currently use the decongestants, 64.4% have ever used the drugs now and in the past. In terms of knowledge of the drugs, 16.6% of the participants are aware of the side effects, 25.2% are aware of the medically recommended period to use the drugs, 21.3% have heard of the nasal congestion addiction, and 21.6% are aware of the medication that may cause nasal congestion. **Conclusion:** The study established that the level of awareness on the use nasal decongestants and the side effects is not significant. There needs to be a sensitization campaign to educate the population on the use of nasal decongestants.

**Keywords:** Allergic rhinitis, awareness, nasal decongestants, side effects

## Introduction and Literature Review

Nasal decongestants are widely used drugs which are used to treat different ENT diseases including allergic rhinitis. These are vasoconstrictive drugs that aims to decrease nasal congestion by decreasing the size of the edematous mucous membrane. The

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Received: 25-06-2021

Revised: 24-09-2021

Accepted: 23-10-2021

Published: 10-03-2022

### Access this article online

#### Quick Response Code:



**Website:**  
www.jfmpc.com

**DOI:**  
10.4103/jfmpc.jfmpc\_1258\_21

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**How to cite this article:** Almutairi A, Almutairi H, Althwiny FA, Almutairi A, Alwasil S, Albadrani N, *et al.* Awareness of the Unaizah populations in Al-Qassim province in Saudi Arabia regarding nasal decongestant use for allergic rhinitis and their side effect. J Family Med Prim Care 2022;11:1070-6.

use of these drugs is associated with side effects especially with long term use.

Allergic rhinitis is a common disease that may affect people of all ages. It is frequently misdiagnosed and mistreated. Although allergic rhinitis is not a critical illness, it is clinically diagnosed because it underlies many complications, and may affect quality of life and productivity at school or work.

Allergic rhinitis, is the most common form of atopic disease, has an estimated prevalence ranging from 5 to 22%. Perennial AR is defined as occurring during approximately 9 months of the year. AR affects 20–40 million people in the United States, and the incidence is increasing; 20% of cases are seasonal allergic rhinitis; 40% of cases are perennial rhinitis; and 40% of cases are mixed.

The pathophysiology of seasonal allergic rhinitis is complex. There is strong genetic component to the allergic response, which is driven through mucosal infiltration and action on plasma cells, mast cells, and eosinophils.<sup>[1]</sup>

The signs and symptoms of allergic rhinitis is characterized by sneezing, nasal congestion rhinorrhea, and pruritus of the nose. Other symptoms, such as “popping” of the ears, and coughing, are less common.<sup>[2]</sup>

Lines of treatment are intranasal glucocorticoids, oral and nasal antihistamines, leukotriene-receptor antagonists, and, when pharmacotherapy is not effective or produces unacceptable side effects, we must discontinue and use other lines.<sup>[3]</sup>

The most common line of treatment of allergic rhinitis is nasal decongestant but this type of treatment has a lot of side effect and people don't have full awareness about nasal decongestant and how to use it. Systemic and topical nasal decongestant medications are commonly used by general practice among the general population and otorhinolaryngology.<sup>[4]</sup>

Systemic and topical nasal decongestant medications are used systemically or locally in the form of drops or nasal spray These medications are most commonly used for opening of the airway, reduce obstruction and secretions, relieve pain in common cold, sinusitis, acute or chronic rhinitis, allergic rhinitis, nasal polyps, etc., However, users should be informed of the type preparation, the active substance it contains and the correct dosage regimen.<sup>[5]</sup>

The medications that can act as sympathomimetic agents are decongestants. They cause local vasoconstriction, thereby reducing nasal mucosal obstruction and edema.<sup>[4]</sup> Nasal decongestant drugs are alpha-adrenergic agonists such as oxymetazoline, xylometazoline, phenylephrine hydrochloride, pseudoephedrine, naphazoline, hydrochloride, tetrahydrozoline, hydrochloride, clomazone, hydroxyamphetamine, tuaminoheptane, and phenylpropanolamine, which are sympathomimetic agents that imitate sympathetic central nervous system activity in the body.<sup>[5]</sup> Rebound congestion is characterized by decay of the sensation

of nasal blockage for which skin nasal decongestants were at first recommended during rehashed use or in the wake of halting this treatment.

Two pharmacobiological theories have been detailed based on these investigations in solid subjects to clarify rebound congestion.

Theory 1: this impact might be because of ischemia of the nasal mucosa; incitement of  $\alpha_2$  receptors prompts exceptional vasoconstriction of submucosal arterioles. This ischemia would incline to the advancement of interstitial edema.

Theory 2: the quantity of film  $\alpha$  adrenergic receptors would be diminished by downregulation and endogenous noradrenaline creation would be diminished by presynaptic negative criticism. These impacts would initiate relative dilatation of the submucosal sinusoid venous plexuses because of loss of dynamic venous vasoconstriction.

Adrenergic receptors could likewise get obstinate to nasal decongestants, making the patient increment the portions of nasal decongestants (tachyphylaxis). This wonder would be related with diminished affectability to endogenous catecholamines, particularly influencing  $\alpha_1$  receptor.<sup>[6]</sup>

Prolonged use of nasal decongestant, especially at short intervals, may decrease the effectiveness of the drug and raise the risk of toxic effects. The symptoms of a sympathomimetic effect may vary. Sometimes there is a depressive effect on the CNS (sedative effect, apnoea, reduced ability to concentrate, sometime a stimulating effect (insomnia, hallucinations, tremors and convulsions). Symptoms of overdose also some time include headache, dizziness, euphoria, tinnitus, blurred vision, ataxia, increased or decreased blood pressure, increased thirst, sweating, nausea, and vomiting.<sup>[7]</sup>

Rhinitis medicamentosa (RM) is one of the nonallergic forms of rhinitis; it is also known as chemical or rebound rhinitis. The most common reason of RM is overuse of topical decongestants. The main complaint in RM is nasal congestion because of edema and vasodilation in the nasal mucosa.<sup>[8]</sup>

Many people do not have full awareness and knowledge about nasal decongestant and how to use it. The role of family physician is to relieve the patient symptoms, provide excellent coordination care and to inform the patient of the appropriate options.

Family physician should be able to easily identify the risk factor and the appropriate way to use it. The aim of the treatment approach by the family physician is to educate people about the side effect and the appropriate way for using nasal decongestant.<sup>[4]</sup>

This study aims to highlight the awareness of the population in Al-Qassim region about nasal decongested use in allergic rhinitis

and their side effects, and the role of family physician regarding the population to provide much of the health maintenance, family planning, and chronic disease care.

## Research Methodology

Set to investigate the level of awareness of the people of Unaizah on the use of nasal decongestants and their side effects. Since there has not been a similar study in the past concerning the use of nasal decongestants, the research was exploratory in nature and descriptive statistics were mostly used to establish significance and inference.

### Study setting

After gaining the institutional Review Board (IRB) approval, the study targeted all patients in the Unaizah region in Al-Qassim province in Saudi Arabia in the year 2021.

### Sample size

The targeted population for the study includes all people in the Unaizah region of Saudi Arabia. A cross-section sample size equation was used to calculate the sample size with a 95% confidence interval and margin of error of 0.05: The targeted sample size was 385 participants.

$$n = \frac{(z\alpha)^2 \times P(1-P)}{d^2}$$

$n$  = estimated sample size

$$z\alpha = 1.96$$

$$d = 0.05$$

### Criteria exclusion and inclusion

Parameters	Inclusion	Exclusion
The geographical location of the study	All around Unaizah	Cities other than Unaizah

### Data collection methods

The data was collected by using an online self-administered questionnaire that was randomly sent to the patients in Unaizah regions who had ever visited both public and private hospitals. For starters, the questionnaire included the following socioeconomic items age, gender, and level of education. The primary endpoints of the questionnaire were to assess the level of awareness and knowledge of the people on the use nasal decongestants. The questionnaire was divided into the usage of nasal decongestant, health condition of the participants at the time of usage and knowledge of the nasal congestion and decongestants.

### Data analysis plan

The data was entered, organized, tabulated, and analyzed by using the standard computer program IBM SPSS Statistics for Windows, version 21.0 program (IBM Corp., Armonk, N.Y.,

USA). Demographic and social status data was tabulated and expressed as frequency and percentage of the total participants. Pie charts and bar graphs were used to illustrate the frequency distribution of the different variables. Chi-square test was used to test the significance of the difference in the distribution of responses and the association of the stated variables. The analysis covered the significant association between the knowledge of the use of the decongestants and demographic characteristics of the participants, the history of the participants' usage of the decongestants.

### Ethical considerations

The study sort for approval from IRB to access information about patients' information in the Al-Qassim region. Also, the questionnaires administered were reviewed by the relevant experts and approved by the directorate of health before being administered to the participants. For participation in the research, informed consent was taken from each participant. Further, the names of the participants were not requested to protect their confidentiality. Identification information was only accessible to the authors. The data was used under strict confidentiality and was only used for the research purpose.

### Findings

Out of the 385 participants, 54% were male and 46% female. With respect to age less than 20 years old 8%, those between 20 and 40 years old 56%, 40--60 years 33%, and over 60 years old (4%). Based on the level of education, those who had attained a Baccalaureus were 79%, Secondary 17%, Medium and Elementary 3% and 1%, respectively [Table 1].

### Usage of nasal decongestant

When evaluated on the usage nasal decongestant, 32.5% of participants currently use while 67.5% do not use, 64.4% have ever used a nasal decongestant, while 35.6% have never used as shown in Figures 1 and 2. In terms of the duration of usage, 15.4% of the participants have used nasal decongestant one to two days, 3--10 days 11.9%, 2--8 weeks 1.60% and over 8 weeks 3.6%. On how often the participants used the nasal decongestants, those who you use one to two times were 52.20%, two to four times 11.2%, more than four times 1%, and those who do not use 35.60% [Figures 3 and 4].

When assessed on who prescribed the nasal decongestants, 31% of the participants were advised by a doctor and 5.8% had the doctor as the main prescriber together with others. 12.7% had a pharmacist's as the main prescriber of the decongestants, 1.6% got the prescription from the media and 6.5% got prescription from someone they know. Only 5% of the participants got the prescription from no one while 35.60% do not use nasal decongestants [Table 2].

The health condition of the patients were then assessed based on what they were suffering at the time of using the nasal decongestant. Patients who suffered from runny nose and

sneezing were 45.7%, 18.7% did not suffer from either, while 35.6% did not use the nasal decongestant. 27.5% suffered from continuous blockage of nose even with the change of weather, while 72.5% did not suffer from the continuous blockage. Based on the following conditions, 7% nasal deviation, sinus allergy (allergy rhinitis) 27.8%, those with both the nasal deviation and sinus allergy were 9.4%, while 55.8% did not suffer from the any of the above condition.

When not using nasal decongestants, the participants reported to have had some complications. Among the main complications was waking up with dry mouth which was reported by 22.1%. Headache and other complications accounted for 10.6%, while anxiety and tension accounted for 2.4%. 64.9% of the participants reported to have not suffered from either complications mentioned above [Figure 5].

When evaluated based on the knowledge of nasal congestion and decongestants, 21.3% of the patients expressed they had heard of nasal congestion addiction while 78.7% had not. 25.2% of the patients were aware of the medically recommended period on the use of a nasal decongestant, 16.6% were aware of the side effects of nasal decongestants while 83.4% were not aware. With regards to the knowledge of medications that may cause

nasal congestion, 21.6% were aware while 78.4% did not know of such medications.

According to Table 3, there was significant relationship between gender and awareness of the medical period recommended for the use nasal decongestants ( $P = 0.010 < 0.05$ ). Another significant relationship was noticed between gender and the knowledge of medication that may cause nasal congestion. A cross-section analysis between age, education, and the knowledge factors of nasal congestion and decongestants showed no significant association (all  $> 0.05$ ).

According to Table 4, there was a significant relationship between patients who currently use nasal decongestants and their awareness on the medically recommended period for the use ( $P = 0.004 < 0.05$ ). A similar relationship was established between patients who have ever used decongestants and their awareness with the medically recommended period and awareness on the side effects of the decongestants ( $P = 0.000$  and  $0.012$ ). With regards to the duration of usage, there was significant association between awareness of the side effects and how long the patients have been using the nasal decongestants ( $P = 0.008 < 0.05$ ) [Tables 5 and 6]. Another significant association was established between how often the patients used the decongestants whether now or past and their awareness on the medically recommended period of use, and their knowledge on the side effects ( $P = 0.000$  and  $0.006 < 0.05$ ) [Table 5].

**Table 1: Patients' Demographic Information**

Patients' Demographic Information		
	n	%
Gender		
Male	206	54%
Female	179	46%
	385	
Age		
<20 years old	30	8%
20-40 years old	214	56%
40-60 years old	125	33%
Over 60 Years old	16	4%
	385	
Education Level		
Elementary	3	1%
Medium	12	3%
Secondary	67	17%
Baccalaureus	303	79%
	385	

**Table 2: Who prescribed the nasal decongestants?**

Who prescribed the nasal decongestants?	n	%
Doctor	120	31%
Doctor and Others	22	5.8%
Pharmacist	49	12.7%
Pharmacist and others	7	1.8%
Media	6	1.6%
Someone I know	25	6.5%
No one	19	5.0%
I do not use it	137	35.6%

## Discussion

The findings in this study are based on a cross-section study done on 385 participants in the Amaziah region in Al-Qassim

**Table 3: Health Situation for using Nasal decongestion**

Health situation	n (%)
Suffered from runny nose and sneezing when nasal decongestant was used	
Yes	167 (45.7%)
No	72 (18.7%)
I do not use it	136 (35.6%)
Suffering from a continuous blockage of nose even with change in weather	
Yes	106 (27.5%)
No	279 (72.5%)
Are you suffering from the following condition?	
Nasal deviation	27 (7.0%)
Sinus Allergy (Allergic rhinitis)	107 (27.8%)
Sinus Allergy and Nasal deviation	36 (9.4%)
None of the above	215 (55.8%)

**Table 4: When nasal decongestant is not used**

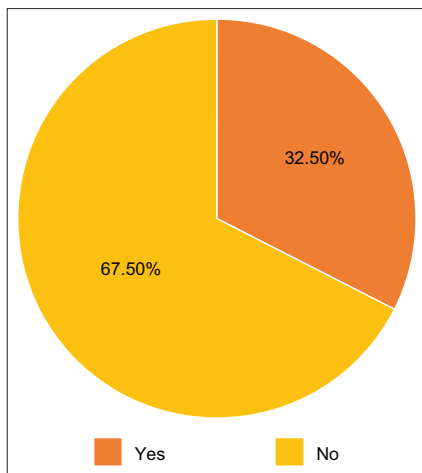
Do you suffer from the following?	n	%
Anxiety and tension when not using decongestants an others	9	2.4%
Headache when not using decongestants and others	41	10.6%
Waking up with a dry mouth	85	22.1%
None of the above	250	64.9%

**Table 5: Demographic factors Cross Knowledge on Nasal Decongestants**

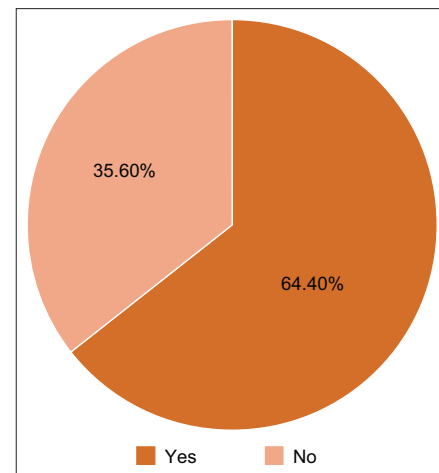
Demographic factors Cross Knowledge on Nasal Decongestants				
	Knows of Nasal Congestion Addiction	Aware of the medical period recommended for the use nasal decongestant	Aware of the side effects of nasal decongestant	Know of medication that cause nasal congestion
<b>Gender</b>				
Male	41 (50.0%)	41 (42.3%)	31 (48.4%)	35 (42.2%)
Female	41 (50.0%)	56 (57.7%)	33 (51.6%)	48 (57.8%)
<i>P</i>	0.473	0.01	0.373	0.019
<b>Age</b>				
<20 years	6 (7.3%)	5 (5.2%)	3 (4.7%)	2 (2.4%)
20-40 years	39 (47.6%)	47 (48.5%)	32 (50.0%)	43 (11.2%)
40-60 years	31 (37.8%)	38 (39.2%)	26 (40.6%)	35 (42.2%)
Over 60 years	6 (7.3%)	7 (7.2%)	3 (4.7%)	3 (3.6%)
<i>P</i>	0.199	0.07	0.391	0.062
<b>Education</b>				
Elementary	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Medium	1 (1.2%)	2 (2.1%)	3 (4.7%)	2 (2.4%)
Secondary	11 (13.4%)	21 (21.6%)	11 (17.2%)	11 (13.3%)
Baccalaurues	70 (85.4%)	74 (76.3%)	50 (78.1%)	70 (84.3%)
<i>P</i>	0.314	0.405	0.75	0.481

**Table 6: Usage of Nasal Decongestants Cross Knowledge of Nasal congestion and decongestants**

Usage of Nasal Decongestant Cross Knowledge of Nasal congestion and decongestants <i>P</i>				
	Knows of Nasal Congestion Addiction	Aware of the medical period recommended for the use nasal decongestant	Aware of the side effects of nasal decongestant	Know of medication that cause nasal congestion
Currently Uses Nasal Decongestants	0.078	0.004	0.069	0.781
Has ever used Nasal congestants	0.571	0.000	0.012	0.091
How long have used nasal decongestants	0.367	0.092	0.008	0.215
How often do you use nasal decongestants?	0.071	0.000	0.006	0.155



**Figure 1: Currently Use Nasal Decongestant**



**Figure 2: Ever used Nasal Decongestant**

province. The study was done in order to establish the level of awareness of the population in the use of nasal decongestants in the treatment of allergic rhinitis and their side effects. The perceived knowledge of the nasal decongestants was grouped into the following questions, whether participants had knowledge on nasal decongestant addiction, knowledge on the medically recommended period to use the nasal decongestants, knowledge

of the side effects, and knowledge on the medication that may cause nasal congestion. Based on the findings, 21.3% of the participants expressed that they had heard about nasal congestion addiction, 16.6% were aware of the side effects of the nasal decongestants, and those who knew the medically recommended period to use the decongestants were 25.2%. A study on patient's perceived knowledge on the treatment for

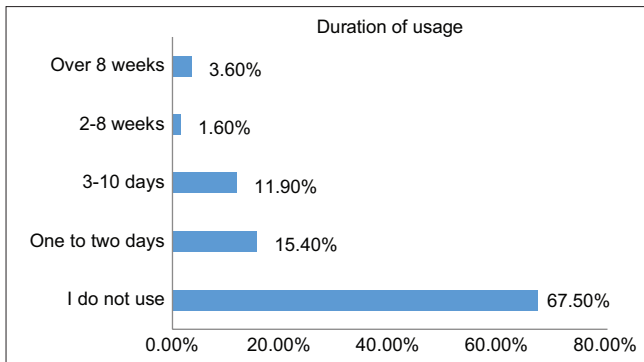


Figure 3: Currently how long have you used nasal decongestant

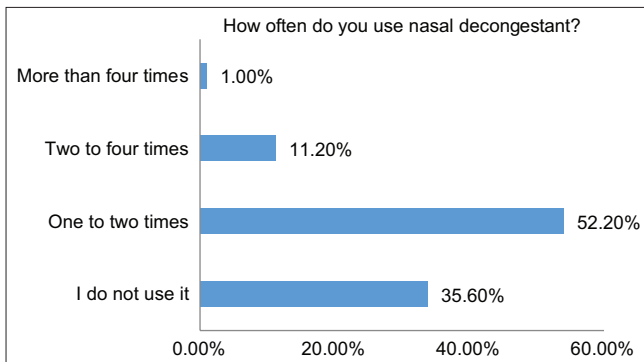


Figure 4: How often do you use nasal decongestant now or past

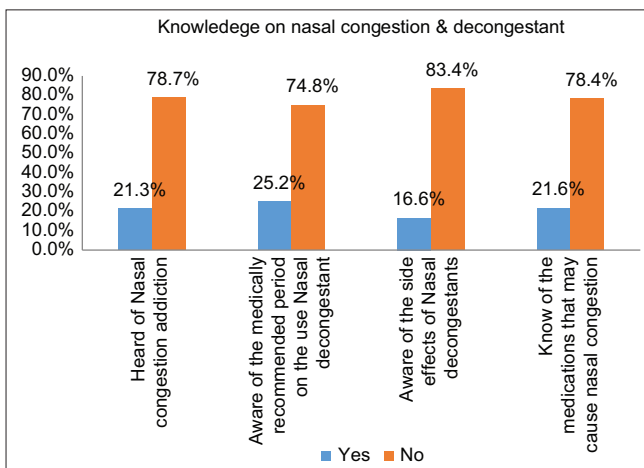


Figure 5: Knowledge of the Nasal Congestion and Usage of Nasal Decongestant

allergic rhinitis established that only a proportionate number of patients with allergic rhinitis perceive to have knowledge on its treatment and the side effects that come with it. According to the findings, patients who had used nasal decongestants and had sinus allergy (allergic rhinitis) accounted for 27.8% while those with both allergic rhinitis and nasal deviation were 9.4%, and only 21.6% of the participants had the knowledge of the medications that cause nasal congestion.<sup>[9]</sup> Another study established that there was an increase in frequency of nasal congestion due to the overuse and misuse of nasal decongestants. This was mainly as a result of lack of unawareness of decongestants that cause nasal

congestion.<sup>[10]</sup> However, the most effective agent to have rapid relief from symptoms is a nasal decongestant, and because of the immediate relief provided by it that there is a high potential for overuse. The overuse of nasal decongestants may result in side-effects and failure to seek advice for a potential chronic underlying condition.<sup>[11]</sup>

A cross-section analysis between gender and the knowledge of nasal congestion and decongestants revealed a significant association between gender and awareness in medically recommended period to use nasal decongestants, knowledge on medication that may cause nasal congestion ( $P < 0.05$ ). From the findings, females appear to be more aware than the males as those who are aware of the medically recommended time account for 57.7% against 42.3% males, while those who are aware of the medication that may cause nasal blockage are 57.8% male and 42.2% males. This is despite males being the majority 54% similar as in study.<sup>[12]</sup> In relation to education level, the knowledge factors of nasal congestion and decongestants increased as the level of literacy increased, which agrees with study.<sup>[13]</sup> From the study, majority of the participants had attained a baccalaureus 79%. In terms of those who had knowledge on nasal addiction, 85.4% had a baccalaureus, 13.4% had a secondary education and medium 1.2%. Similar to those who have knowledge on the side effects, those with a baccalaureus account for 78.1%. This can also be explained by the fact that majority of the population between the age 20 and 40 years old. There is no specific rhinitis pattern especially the symptom severity was related to an increased risk of developing RM or its discontinuation; even sleeping disturbances seem induce patients to the abuse of vasoconstrictors more than other symptoms. A history of psychiatric disorders may be more likely to develop RM and in particular anxiety influences both the probability of developing an addiction to vasoconstrictors and discontinuation of vasoconstrictors.<sup>[14]</sup>

In conclusion, the study established that the level of awareness on the use of nasal decongestants and the side effects is not significant. There needs to be a sensitization campaign to educate the population on the use of nasal decongestants. Since the nasal decongestant are easily accessible as over the counter drugs, the population needs to be encourage to seek prescription from doctors and qualified personnel to prevent incidences of nasal congestion as a result of overuse of nasal decongestant medication.

## Conclusion

The study established that the level of awareness on the use of nasal decongestants and the side effects among the people in Anaijah in Al-Qassim province was not significant. Majority of the people were not informed on nasal decongestant addiction, knowledge on the medically recommended period to use the nasal decongestants, knowledge of the side effects, and knowledge on whether the medication that may cause nasal congestion. This according to the study have led to the misuse of nasal decongestants leading to an increase in nasal congestion. From

the study, the drugs are readily available and there is minimal expert advice from doctors and pharmacist compelling people to rely on acquaintances and the media. The study recommends a sensitization campaign to educate the population on the use of nasal decongestants. Since the nasal decongestants are easily accessible as over the counter drugs, the population needs to be encouraged to seek a prescription from doctors and qualified personnel to prevent incidences of nasal congestion as a result of overuse of nasal decongestant medication.

### Financial support and sponsorship

Nil.

### Conflicts of interest

There are no conflicts of interest.

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