


Prevalence, Beliefs, and the Practice of the Use of Herbal and Dietary Supplements Among Adults in Saudi Arabia: An Observational Study

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Abstract

Background and Aim: Alternative treatments for respiratory disorders attempt to prevent or relieve symptoms and enhance functions. Furthermore, substantial evidence shows that several herbal medicines have been clinically effective against respiratory disorders. Thus this study assesses the Saudi students' use, beliefs, and practices related to herbal and dietary supplements for the possible prevention of respiratory infections. **Methods:** A cross-sectional web-based survey was designed using Google Forms to collect the data from the healthcare and non-healthcare students currently pursuing their courses at King Saud University, Riyadh, Saudi Arabia. The data was collected over 4 months, from November 2021 to February 2022, using convenience sampling with a 25-item questionnaire. A statistical package for social sciences, SPSS 26, was used to analyze the data. **Results:** A total of 274 participants responded to the study. The mean age of the respondents was 21.9 ± 3.08 (mean (SD)). The prevalence of herbal medicine (HM) was found to be 62.7% ($n = 172$). Around 48.5% ($n = 133$) of the respondents occasionally used some form of HM during the period of an illness associated with a respiratory infection. About 66% of the respondents agreed that using HMs prevents or controls respiratory symptoms and strengthens immunity. A majority (75.2%) of the respondents agreed that ginger extract possesses antiviral and immunity-boosting properties, followed by garlic extract (59.5%), cinnamon (39.4%), and lemongrass (38.3%). In addition, between 37% and 45.6% of the respondents agreed that vitamin C and vitamin D intake helps in boosting immunity and reducing the likelihood of developing respiratory infections. The overall mean of the positive beliefs and practice score was 9.6 (range 0–14). The mean positive beliefs and practice scores were significantly higher for males (11.4 ± 3.2) compared to females (8.6 ± 3.6) ($P < .001$). The numbers were not significantly different regardless of the source of information (9.6 ± 3.5), respondents being in health colleges (8.9 ± 4.1) or non-health colleges (9.8 ± 3.7), them being previously or currently infected (9.7 ± 3.8), the absence of infection (9.7 ± 3.8), or the respondents possessing a history of chronic diseases (10.5 ± 3.9) or not (9.5 ± 3.7) ($P > .05$). **Conclusions:** This study found a relatively high prevalence of herbal and dietary supplements' use, positive beliefs, and practices to strengthen one's immunity against respiratory symptoms.

Keywords

prevalence, beliefs, practice, herbal medicine, supplements, vitamin D, ginger extract, garlic, Saudi Arabia, observational study

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What do We Already Know About This Topic?

Educating patients has been shown to have positive effects on their clinical results and quality of life. Complementary and alternative medicines (CAMs) have been used for decades to improve patients' health and treat viral infections, in addition to the conventional pharmaceuticals provided by health care providers. Thus, finding out about the beliefs and practices related to alternative medicines may help in the safe use of supplements.

How Does Your Research Contribute to the Field?

The findings of this research cannot be generalized. However, they place significant pressure on healthcare personnel and consequently the healthcare system to improve patient outcomes and initiate education programs. Pharmacist-led patient counseling efforts are needed, and those could be started too.

What are Your Research's Implications for Theory, Practice, or Policy?

This research sheds light on the beliefs and practices of herbal and dietary supplements for the possible prevention of respiratory infections. The current findings report positive beliefs and practices regarding the use of herbal and dietary supplements to strengthen people's immunity against respiratory symptoms.

Background

Unexpected fear and panic were seen among individuals globally due to the unknown etiology of the new strain of severe acute respiratory syndrome (SARS-CoV-2) virus and the resultant disease of COVID-19, which posed symptoms of respiratory infections¹⁻³ that spread rapidly, leading to the declaration of a health emergency of international concern. According to previous literature, complementary and alternative medicines (CAMs) have been used for decades to improve patients' health and treat viral infections, in addition to the conventional medication provided by health care providers.

Alternative treatments for respiratory disorders attempt to prevent or relieve symptoms and enhance functions.⁴ Furthermore, substantial evidence shows that several herbal medicines have been clinically effective against respiratory disorders.⁵⁻⁹ According to previous research, the most generally cited CAMs that treat respiratory infections include pomegranate, guava tea, garlic extract, and licorice roots.⁵⁻⁷ Furthermore, studies have found ginseng to be effective in the treatment of respiratory infections.^{8,9}

The use of complementary and natural remedies to improve health, prevent diseases, and treat illnesses is widespread.¹⁰⁻¹³ Herbal medicine (HM) use is common in developing countries and many Arabian countries.¹⁴⁻¹⁷ Studies have revealed that the increased use of HMs for the management of chronic diseases is either due to the high cost of allopathic treatment or some dissatisfaction with conventional medicine.¹⁸⁻²⁰ In Saudi Arabia, Alghamdi et al reported that the most frequently used HMs were *Pimpinella anisum*, *Nigella sativa*, and green tea extracts.²¹

Similarly, another recent study by Al-Yousef et al reported that 51% of the respondents believed HM to be better than commercially available prescription drugs. Ginger and cinnamon were the most commonly reported HMs among the Saudi public.¹² However, it is believed that black cumin (*Nigella sativa*) is a prophetic medicine, the use of which is

common in Arabian countries. About 70% of the Saudi public have used prophetic medicine at least once in their lifetime.^{22,23} It has also been reported that Africans (80%), Chinese (40%), and Americans (50%) have utilized HMs for their health care needs. Further, studies have reported that several herbs and their products were used to boost immunity against several epidemiological diseases.²⁴⁻²⁶

In recent years, viral respiratory illnesses, notably influenza viruses, have had a substantial impact on communities worldwide due to the lack of a viable treatment or vaccine. The development of successful immunizations is complex due to the frequent changes in the antigenic structures of respiratory viruses, particularly ribonucleic acid (RNA) viruses. The shortage of vaccines and the lack of adequate treatment highlight the need for alternative natural cures. The role of herbs and natural medicines in society is unique for treating minor ailments and some acute and chronic diseases since HMs can be considered free from toxins compared to conventional medications.^{26,27} Furthermore, several herbal remedies are used to prevent and cure viral respiratory illnesses. The many complementary therapies for colds prove to be substantial evidence.²⁷ Oral zinc may assist in shortening the duration and intensity of a cold. However, regularly taking vitamin C supplements has minimal impact on the duration and severity of colds.²⁸

To date, no study has been conducted in Saudi Arabia to investigate HM use for the possible prevention of respiratory infections. Therefore, this study investigates the Saudi students' use, beliefs, and practice concerning herbal and dietary supplements for the possible prevention of respiratory infections.

Materials and Methods

Study Design and Setting

A cross-sectional web-based survey was designed using Google Forms to collect the data over 4 months, from November 2021 to February 2022. The study participants were

from King Saud University and included those from major health subjects (pharmacy, dentistry, medicine, nursing, and allied health care) as well. The data collection was done through social media. The male and female respondents who expressed willingness to complete the survey and were in their final year at King Saud University, aged ≥ 18 years, and were living in Riyadh city were included in the study. However, respondents who did not fulfill the inclusion criteria were not.

The study investigators shared the survey link with the leaders of each course, who were requested to pass it on further. Participants got auto-directed to the informed consent page on receiving and clicking the link. Only after that could they fill out the survey questionnaire. The clause stating that the filled information would be used for publication purposes was highlighted.

Study Sample

The sample size for this study was calculated using the Raosoft calculator, assuming a confidence interval of 95%, a standard deviation (SD) of 0.5, a margin of error of 5%, and a total of 1000 senior students population. Therefore, the required sample size for this study was 278. Accounting for non-response, dropout, and subgroup analyses, our final sample size was planned to be 280 completed questionnaires from participants.

Questionnaire Development

The questionnaire for this study was developed using previous studies.²⁹⁻³¹ The questions were divided into 4 sets. The first set dealt with participant demography with a total of 6 items, including age, gender, course of study, year of study, chronic disease history, and the presence of any respiratory infections. The second set dealt with practice and opinions and had 4 questions. The one asked about the respondent's history of HM use during respiratory infections. The second question asked about their motivation to use HM. The third focused on the use of herbal and dietary supplements to prevent or control respiratory infections and strengthen one's immunity. There was also a question about the student's opinion towards steam inhalation using essential oils to kill the bacteria. All the responses were recorded on a four-point Likert scale: Agree, Disagree, Maybe, I don't know.

The third part of the questionnaire collected details about beliefs, with 14 items in total. The last part of the questionnaire consisted of one multiple-choice, multiple-answer question asked the student's beliefs about the herbs exhibiting antiviral and immunity-boosting properties, thus protecting the human body against respiratory infections.

The final questionnaire was translated into Arabic using a forward-and-backward translation procedure. Then, the study tool was subjected to content validation by an expert group consisting of two assistant professors and one researcher from the clinical pharmacy, familiar with preparing study

questionnaires. According to the group's opinions, some amendments were made. Before proceeding to the original study, a pilot study was conducted among a small number of randomly selected respondents ($n = 10$).

The reliability of the questionnaire was then determined using Cronbach's alpha, which was found to be 0.81, indicating that the questionnaire was suitable for the study. Data collection was carried out by a team of 2 members: a researcher with experience in data collection and a PharmD undergraduate trained in data collection. The data collection was conducted using convenience sampling methods until the required sample size was obtained.

Statistical Analysis

The collected data were analyzed using the IBM SPSS Statistics 26 (IBM Inc., Chicago, IL, USA) and the IBM SPSS 22 (IBM Inc., Chicago, IL, USA) software. Descriptive statistics, frequencies, and percentages were used to summarize the data. The data were presented in frequencies (n) and percentages (%). The continuous data were expressed by the mean and SD. A normality test was conducted for the dependent (student beliefs and practices) and independent variables (gender, college, source of information, previous or current infection with flu, cough, or a sore throat, and history of chronic disease) to test whether respondents' perception was normally distributed among the independent variables. It was found that the data were normally distributed. Therefore, Student's t -test was preferred to test for the differences in perception among the independent groups.

Results

A total of 274 respondents responded to the study. The respondents were majorly male (62%; $n = 170$), while the rest of them (38%; $n = 104$) were females. The mean age of the participants was 21.9 ± 3.08 . The majority of the respondents were students of pharmacy (69.7%; $n = 191$), engineering (8.8%; $n = 24$), and dentistry (7.3%; $n = 20$). Of them, 90.1% ($n = 247$) were free from chronic disease history. About 12% of the respondents were found with a respiratory infection. Further, the source of information on the use of HMs or CAMs for the prevention of respiratory infections among the surveyed respondents was the Ministry of Health (65.3%; $n = 179$), social media (23%; $n = 63$), and friends and family (6.2%; $n = 17$). A detailed description of the demographics is given in [Table 1](#).

Around 48.5% ($n = 133$) of the respondents occasionally used some form of HM when infected to prevent any respiration-related symptoms. A slightly lesser number of respondents ($n = 122$; 44.5%) accepted that relatives or friends had suggested that they use herbal or dietary supplements. More than half of the respondents (55.5%) used foods and herbs as supplements to prevent or control respiratory infections and strengthen immunity. However,

Table 1. Demographic Distribution of Participants (n = 274).

Demographic Data	Number of Participants (n)	Frequency (%)
Gender		
Male	170	62
Female	104	38
Age (Mean ± Std)	21.9 ± 3.08	
College		
Pharmacy	191	69.7
Engineering	24	8.8
Nursing	20	7.3
Dentistry	9	3.3
Medicine	10	3.6
Business management	10	3.6
Science	10	3.6
History of chronic disease		
Yes	27	9.9
No	247	90.1
Previously or currently infected with flu, cough, or Sorethroat (Respiratory symptoms)		
Yes	31	11.3
No	243	88.7
Source of information to use herbal and alternative supplements for the prevention of respiratory symptoms		
Ministry of health	179	65.3
Social media	63	23
Family and friends	17	6.2
Television	12	4.4
Printed resources	3	1.1

nearly half of them (48.2%; n = 132) disagreed with steam inhalation being the best way to prevent or kill respiratory infections (Table 2). Figure 1 shows the respondents' knowledge about CAMs that exhibit antiviral and immunity-boosting properties, which protect the human body against respiratory infections. Most of them (75.2%) agreed that ginger extract possesses antiviral and immunity-boosting properties. This was followed by garlic extract (59.5%), cinnamon (39.4%), and lemongrass oil (38.3%), as shown in Figure 1.

Beliefs and Practices of Saudi Respondents Concerning Herbal and Alternative Therapies for Respiratory Infections

Around 36.5% (n = 100) agreed that a large amount of vitamin C intake helps boost immunity and reduce the likelihood of developing respiratory infections. In terms of participants' practices involving herbal and alternative therapies for respiratory illnesses (like flu, cough, etc.), 45.6% (n = 125) of the participants believed that vitamin D helps in improving immunity. Slightly more than one-third of

Table 2. Herbal Medicine Use Among the Respondents.

Statements	Frequency (n)	Percentage (%)
Do you use any form of HM during the pandemic to prevent any COVID-19 related symptoms (like flu, cough, throat pain)?		
Always	39	14.2
Occasional	133	48.5
Never	82	29.9
I don't know	20	7.3
If you have used or using the herbal or dietary supplements suggested, you to take		
Health care provider	37	13.5
Social media	14	5.1
Relatives/friends	122	44.5
Self-administration	71	25.9
Others	30	10.9
Do you agree that using foods and herbs as a supplement prevents or controls the COVID-19 infection and strengthen immunity?		
Agree	152	55.5
Disagree	33	12
Maybe	80	29.2
I don't know	9	3.3

the participants (37.2%) agreed that intake of ginger-and-honey mixture helps decrease the risk of flu and cough infections. Further, 46% (n = 126) of the participants reported that saline hot-water gargling is the best way to cure a sore throat. When asked about the dehydration associated with respiratory infection symptoms, most (70.8%) agreed that drinking clean water helps control it. In contrast, only 38% of the participants agreed that using turmeric enhances the immune system and protects the body against flu infections.

Consuming garlic, fish oil (omega-3), and onions (31.8%) was thought to enhance immunity against infection by 46.4%, 48.9%, and 31.8% of the respondents, respectively. Collectively, 50.7% thought that using these vitamins and herbs could boost the immune system and protect the body against respiratory symptoms. The respondents practiced herbal therapies by consuming honey and lemon tea (48.5%) and costus roots (25.2%) to help increase immunity and reduce the chance of developing a flu-like infection. Additionally, half of the respondents (51.5%) believed that the intake of black cumin (prophetic medicines) aids in raise of immunity and reduces the probability of developing respiratory infections. Detailed responses regarding the practice of herbal and alternative therapies for respiratory infections are illustrated in Table 3.

The mean positive beliefs and practice scores were significantly higher for males compared to females ($P < .001$). However, the mean positive beliefs and practice scores were not significantly different regardless of the source of information used, the respondents being in health colleges or non-health colleges, the presence or absence of respiratory infections, or chronic diseases history (Table 4).

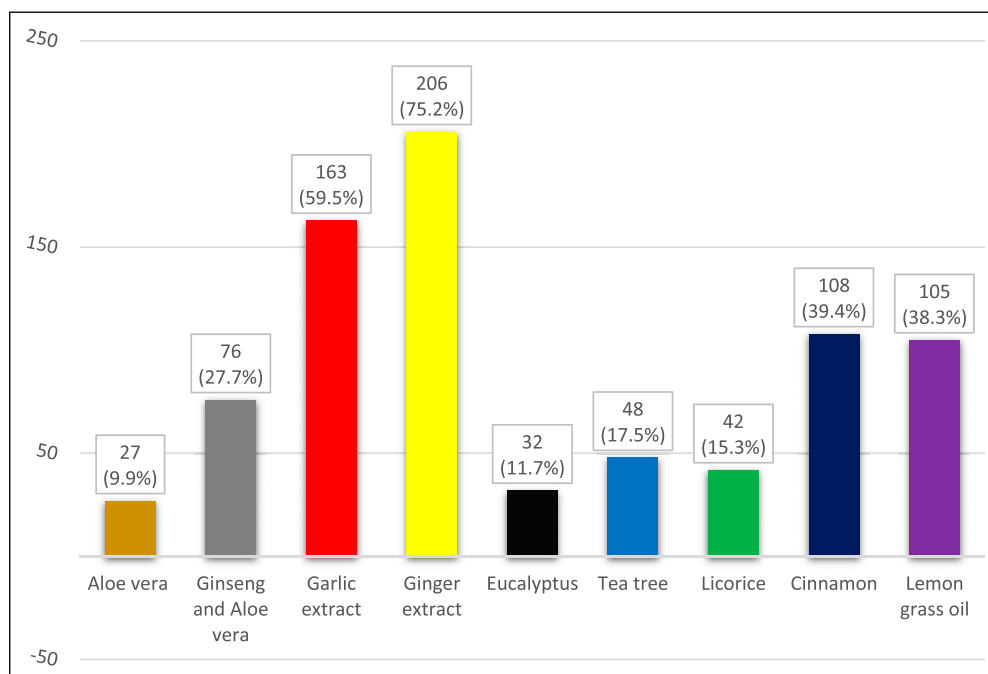


Figure 1. Knowledge about the type of herbs that exhibit the antiviral effect.

Discussion

It is well documented that the use of herbal alternatives over conventional medicine is more common in treating viral infections and chronic diseases in both developed and developing countries.^{12,13} However, this is the first study to evaluate the prevalence of the use, beliefs, and practices related to herbal and dietary supplements in Saudi Arabia using students' prospects, given the high prevalence of the use of HM in Saudi Arabia and other Arabian countries as reported in earlier studies.^{11-15,17,21,29}

The current findings revealed that approximately 15% of the Saudi students used some form of HM for the possible prevention of respiration-related infections. Further, more than half (55.5%) of the students agreed to using foods and herbs as supplements to prevent or control respiratory infections and strengthen their immunity. These results were comparable to a previous study by Alyami et al among the general public, who reported that 22% of the participants used HMs to prevent similar infections.³⁰ Similarly, another recent study by El Alami reported the use of different plants, including garlic, olive, onion, and ginger, for the possible prevention of COVID-19, which has symptoms similar to viral infections.³¹ Clearly, the use of HMs to prevent chronic diseases or enhance immunity is commonly reported by multiple studies worldwide.^{14-17,30,31} This could be due to a lack of treatment or the beliefs about the safety of HM over allopathic medicine.

The current study found that more than half of the Saudi students believed that herbal supplements might help combat

respiratory infections and strengthen immunity. These results were similar to previous studies conducted worldwide, including one in Poland.^{28,32,33} Similarly, another recent survey among Saudi students by Samreen et al in 2020 reported that 46.8% of university students used dietary supplements for health and wellbeing.³³⁻³⁵

In this study, between 37% and 46% of the participants agreed that vitamin C and vitamin D supplements help in increasing immunity and reducing the chances of developing flu-like infections. In contrast, a similar study published by Alyami et al among the general public reported that approximately 95% of the study participants used vitamin C to control respiratory infection.³⁰ Similar results were reported by Hamulka et al, where the authors found that the most common supplements used among the participants during the first and second waves of the pandemic were vitamin D (38% and 67%, respectively), vitamin C (17% and 37%, respectively), and omega-3 fatty acids (15% and 35%, respectively) to control the flu-like symptoms associated with COVID-19.³² Indeed, there was literature suggesting that the use of vitamin D and vitamin C may reduce the chances of developing flu-like symptoms. Additionally, studies also revealed the consumption of supplements increased immunity against various infections.^{35,36}

In this study, most of the students (75.2%) agreed that ginger extract possesses antiviral and immunity-boosting properties. Next, garlic extract was favored (59.5%), and cinnamon followed (39.4%). According to an earlier published report, ginger and garlic possess intense antiviral properties and are considered a key to building and keeping

Table 3. Beliefs and Practices About Herbal and Alternative Therapies for Prevention and Treatment of Respiratory Infection.

Variables	Strongly Agree n (%)	Agree n (%)	Disagree n (%)	I don't know n (%)	Positive beliefs and practice (N (%))
Intake of vitamin C helps increase immunity and reduce the chances of developing Respiratory infection	100 (36.5)	96 (35)	59 (21.5)	19 (6.9)	196 (71.5)
Vitamin D helps in improving immunity, which may reduce the risk of the common cold	125 (45.6)	79 (28.8)	36 (13.1)	34 (12.4)	204 (74.5)
Do you think taking a ginger and honey mixture helps in preventing the chances of developing flu and cough	102 (37.2)	85 (31)	57 (20.8)	30 (10.9)	187 (68.2)
Gargling with a solution of warm salt water is the best way to battle sore throat by killing germs and viruses	126 (46)	95 (34.7)	34 (12.4)	19 (6.9)	221 (80.7)
Supplementing 1 spoon full of apple cider vinegar (ACV) mixed with warm water helps increase immunity and reduce the chances of developing respiratory infection	58 (21.2)	68 (24.8)	65 (23.7)	83 (30.3)	126 (46)
Drinking plenty of clean water helps in controlling the dehydration associated with symptoms of respiratory (flu, cough, sore throat)	194 (70.8)	58 (21.2)	8 (2.9)	14 (5.1)	252 (92)
The use of turmeric in a daily routine will help strengthen immunity against respiratory infection	104 (38)	59 (21.5)	43 (15.7)	68 (24.8)	163 (59.5)
Do you think that eating garlic helps to increase immunity and reduce the chance of developing a respiratory infection?	127 (46.4)	85 (31)	28 (10.2)	34 (12.4)	212 (77.4)
Do you think that eating onions (or onion peel) help to increase immunity and reduce the chance of developing a respiratory infection?	87 (31.8)	75 (27.4)	50 (18.2)	62 (22.6)	162 (59.1)
Do you think that eating fish oil known as omega-3 helps to increase immunity and reduce the chance of developing a respiratory infection?	134 (48.9)	67 (24.5)	36 (13.1)	37 (13.5)	201 (73.4)
Do you think that vitamins and herbal supplements treat/ reduce the incidence of respiratory infection?	139 (50.7)	75 (27.4)	36 (13.1)	24 (8.8)	214 (78.1)
Do you think that consuming honey and lemon tea helps increase immunity and reduce the chance of developing flu or cough and sore throat?	133 (48.5)	72 (26.3)	45 (16.4)	24 (8.8)	205 (74.8)
Do you think that consuming costus roots helps increase immunity and reduce the chance of developing a respiratory infection?	69 (25.2)	54 (19.7)	53 (19.3)	98 (35.8)	123 (44.9)
Do you think that eating black seeds (Prophetic medicines) helps increase immunity and reduce the chance of developing a respiratory infection?	141 (51.5)	77 (28.1)	30 (10.9)	26 (9.5)	218 (79.6)
Steam inhalation (using essential oils) is the greatest way of preventing/or killing the respiratory infection	44 (16.1)	132 (48.2)	45 (16.4)	53 (19.3)	167 (60.9)

the immune system strong.³⁷ In this study, strengthening immunity and preventing the symptoms associated with respiratory infections were the main reasons for the use of dietary and herbal supplements. Notably, the study by Hamulka et al³² reported that turmeric, garlic, fermented vegetables, lemon, honey, and ginger were the most common herbal supplements among the study participants to improve immunity and overall health and wellness. The notion that herbal and dietary supplements were safer and of higher quality than conventional treatments contributed to the rising usage of herbal and nutritional supplements.^{12,38} However, several studies reported that dissatisfaction with allopathic medication, in addition to their high cost and feared side effects, influenced people's decisions to switch to CAMs and

HMs. Other reasons were family traditions and the good experience their friends had had with CAMs.^{12,38-40}

In this study, nearly half of the participants agreed that hot-water saline gargling is the best way to battle a sore throat infection by killing germs and viruses. Also, the majority of them believed that drinking plenty of clean water helps combat the dehydration associated with symptoms of respiratory illness. Additionally, more recent reports by Healthline revealed that staying hydrated helps maintain overall health and wellbeing.⁴¹ Furthermore, the National Health Service (NHS) recommended that adults living in the United Kingdom gargle with salt water to relieve symptoms of a sore throat, but not as preventative medicine for respiratory infection.⁴²

Table 4. Association of Beliefs and Practices About Herbal and Alternative Therapies for Prevention and Treatment of Respiratory Infection With Demographic Characteristics.

	Positive beliefs and practice score Mean (SD) (range 0-14)	P-value
Gender		<.001
Male	11.4 (3.2)	
Female	8.6 (3.6)	
Colleges		.198
Health colleges	8.9 (4.1)	
Non-health colleges	9.8 (3.7)	
Source of information		.697
Ministry of health (MOH), Television (TV) and radio, and printed materials	9.6 (3.5)	
Social media, family and friends and	9.7 (3.8)	
Currently or previously infected with a respiratory infection		.785
Yes	9.5 (3.4)	
No	9.7 (3.8)	
Chronic disease		.228
Yes	10.5 (3.9)	
No	9.5 (3.7)	

In addition to this, most students have positive beliefs about consuming fish oil or omega-3 supplements to increase immunity and reduce the chance of developing illnesses. Also, 52% of the students agreed that eating black cumin (prophetic medicines) helps boost immunity and reduce the chance of developing infections. Oil derived from the black cumin plant is often referred to as “the seed of blessing” due to its numerous benefits. It can treat respiratory issues, inflammation, arthritis, and digestive disorders. It also boosts the immune system and alleviates cold and flu symptoms.⁴³

This study has several strengths. Firstly, only limited studies had been conducted in Saudi Arabia to assess healthcare and non-healthcare students’ beliefs and practices related to HMs used for the prevention of respiratory infections (flu, cough, sore throat). The study’s findings may help identify the gaps in students’ knowledge and work towards improving it through educational interventions.

However, there are certain limitations to the current study. Firstly, the findings were based on a self-administered questionnaire, which could have increased the risk of social desirability or recall biases. Secondly, the findings came from a single university, making them unrepresentative of others and ungeneralizable globally. Thirdly, the survey did not include students from other universities in Saudi

Arabia because it was done at the oldest and first university in Saudi Arabia, which provided better access to students when disseminating the questionnaire. Despite these limitations, this study advises that more focus be placed on

enhancing individuals’ awareness of herbal and dietary supplements to encourage their bettered and safer use and support the development of messages aimed at safely using alternative supplements.

Conclusion

This study found a relatively high usage of herbal and dietary supplements among undergraduates in Saudi Arabia. Additionally, it found that students have positive beliefs and practices related to the use of herbal and dietary supplements for the possible prevention of respiratory infections. Substantial proportions of students always used herbal and dietary supplements during the infections. The majority of the students agreed that dietary and herbal products help strengthen their immunity against respiratory illnesses. However, it is essential to educate the participants and other people about the safe use of herbal and dietary supplements. Future studies are needed to study the adverse effects of herbal medicine use during various infections.

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Author Contributions

WS, OS, AA, AB, MBA conceived of this study and its design. WS, OS, AA conducted the data collection. WS, OS, AA, AB, MBA reviewed and edited. WS, OS, AA, AB, MBA performed the screening process. WS, OS, AA, AB, MBA performed the content analysis and coding. WS, OS was involved in interpreting the results. All authors have read and agreed to the published version of the manuscript.

Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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Institutional Review Board Statement

Before data collection, the study protocol and questionnaires were reviewed by an ethical committee from the College of Medicine, King Saud University. This study was approved by the college of medicine, King Saud University, Riyadh, Saudi Arabia with the following reference number- E-20-5591.

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