

ORIGINAL ARTICLE

Herbal medicine use among medical students in Eastern Saudi Arabia: a single-center cross-sectional study

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ABSTRACT

Background: Despite the growing reliance on evidence-based medicine, the use of herbal medicine remains common. In Saudi Arabia, medical curricula focus on evidence-based medicine, raising questions about the influence of modern medicine teaching on students' use of herbal remedies. However, no previous study has been conducted in the Eastern Region of Saudi Arabia, particularly in Al-Ahsa.

Methods: A cross-sectional study was conducted among 332 medical students at King Faisal University using a structured questionnaire adapted from a previous study. The questionnaire assessed herbal medicine use and perceptions toward it. Data were collected electronically and analyzed using SPSS version 29.

Results: The majority of students reported prior use of herbal medicine (82.2%), and 54.5% expressed interest in it. Herbal medicine was used for both therapeutic and cosmetic purposes. In addition, 41.9% of students reported sometimes avoiding manufactured medicine in favor of herbal remedies, and 33.7% believed herbal medicine is safer than manufactured drugs. No significant association was found between herbal medicine use and gender, academic year, residence, or family income ($p > 0.05$).

Conclusion: Herbal medicine use remains highly prevalent among medical students and appears strongly influenced by cultural and religious factors. These findings highlight the need to incorporate herbal medicine education into medical curricula to promote safe practices and improve awareness of potential risks.

Keywords: Herbal medicine, prevalence, medical student, university students, King Faisal University, modern medicine.

Introduction

Plants are an important source of nutrition for humans. Through history, humans have discovered that plants have healing properties. And from this point onward, the concept of herbal medicine was created. One of the oldest known herbal medical books was "The Divine Farmer's Classic of Herbalism" [1], written by Shen Nong, one of the greatest heroes of Chinese culture. This book states the medical properties of various foods, including fruit, vegetables, and cereals [2].

Similarly, Islamic and Arabic cultures are well-known for their contributions to herbal medicine. During the sixth and seventh centuries, botanical science and the use of medicinal herbs reached their peak in the Islamic world. Many Islamic scientists have contributed to the development of herbal medicine. For example, Abu Ja'far al-Ghafqi has written one of the best books that

combines medicine and botany, which is called "Al-adwei Al-Mafrud" [3].

According to the Convention on Biological Diversity website, Saudi Arabia is home to 2,250 species of flowering plants, of which 334 are used in medicine or have medicinal value [4].

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Previous research has shown that Green Tea, Mint, Chamomile, Cinnamomum, Sage, Roselle, Thyme, Marjoram, and Fennel are very popular among Saudi citizens [5]. A study done in Jazan, Saudi Arabia, states that most people use herbal medicine to treat diabetes mellitus and hypertension [6]. Another broad study conducted across various regions of Saudi Arabia found that herbal medicine is commonly used to treat coughs, the flu, colds, and abdominal pain [7].

Due to advances in modern medicine, the use of herbal medicines has gradually decreased. Furthermore, current medical education emphasizes evidence-based medical teaching. This may influence the student's attitude toward herbal medicine.

This raises an important question: Does modern medical education affect medical students' use of herbal medicines? Several studies have been done regarding this issue. A previous study conducted in Ghana at the University for Development Studies found that most of its medical students use herbal medicine and are satisfied with the treatment outcomes. And surprisingly, the source of the recommendation was their relatives, who are likely to have less medical knowledge [8]. A similar study conducted at Kuwait University found that more than half of its medical and pharmacy students had used complementary and alternative therapies, with herbal products being the most commonly used form. Interestingly, this study also revealed that medical students have limited knowledge of complementary and alternative therapies, which supports the theory that modern medical education influences knowledge of herbal medicine [9].

On the contrary, a recent study done at King Abdulaziz University for Health Sciences showed opposite findings. In this study, 79.2% of medical students had never used herbal medicine. Also, the majority of the participants had adequate knowledge about herbal medicine [10]. This discrepancy may be attributed to regional cultural differences, as western Saudi Arabia has historically been influenced by diverse cultures through pilgrimage and international interaction.

Currently, there is limited research in Saudi Arabia on medical students' use of herbal medicine, and none has been conducted in the eastern region, particularly Al-Ahsa, underscoring the need for further research in this area. This study aims to assess the prevalence of herbal medicine use among medical students at King Faisal University and to evaluate their attitude toward it.

Methodology

Setting

King Faisal University.

Study design

A cross-sectional study was conducted using a structured questionnaire adapted from a previous study [7]. Convenience sampling was used to distribute the questionnaire to medical students at King Faisal University in Al-Ahsa. The data were collected over the

period of June 2024 to April 2026. The questionnaire was designed to assess the prevalence of herbal medicine and the perceptions of it.

Study population

The target population in this study included all undergraduate medical students who studied at King Faisal University in Al-Ahsa. The students who were accessible during the study period were chosen as the sample. A convenience sampling method was used to recruit participants through an online self-administered questionnaire.

Sample size

The estimated total number of medical students at King Faisal University was 1,500 students, and the sample size was calculated using the Raosoft sample size calculator, assuming a 95% confidence level, a 5% margin of error, and an assumed response distribution of 50%, which was selected to provide a more conservative sample size assumption. The minimum required sample size was calculated to be 306 participants.

Inclusion/exclusion criteria

- Inclusion criteria:

All undergraduate medical students who are currently studying at King Faisal University.

- Exclusion criteria:

Students from other colleges and universities, and those who decline to participate.

Study instrument

To assess the prevalence of and attitudes toward herbal medicine use, a structured questionnaire was developed based on previously published studies on the same topic [7]. The questionnaire was divided into three sections. Section A collected demographic data, including gender, academic year, residence, and family income. Section B assessed participants' perceptions and attitudes toward herbal medicine use. Section C evaluated the frequency of herbal medicine use, sources of information, and whether participants used herbal remedies for their children. A pilot study was conducted to assess the clarity and reliability of the questionnaire. The final questionnaire demonstrated a Cronbach's alpha of 0.519. The questionnaire was administered online via WhatsApp from June 2024 to April 2026, and informed consent was secured from all participants before participation.

Data collection

Data were collected using an online-structured questionnaire distributed via WhatsApp. The data collection period extended from June 2024 to April 2026. Participants were invited to complete the questionnaire after receiving an explanation of the purpose of the study, and informed consent was obtained electronically before participation. The questionnaire was self-administered and designed to be completed anonymously. Responses

were collected and recorded for analysis upon submission. The total number of invited participants could not be determined due to distribution through multiple WhatsApp groups; therefore, the response rate was not calculated.

Statistical plan

Data were analyzed using SPSS version 29 [11]. Descriptive statistics were presented as frequencies and percentages. Bivariate analysis was performed using chi-square or Fisher's exact test to assess associations between independent variables and herbal medicine use. Variables with $p < 0.05$ were considered statistically significant. Multivariate analysis was conducted using binary logistic regression to identify independent predictors of herbal medicine use, with results reported as odds ratios [Exp(B)] and 95% confidence intervals. A p -value < 0.05 was considered statistically significant throughout the analysis.

Results

Our study included 332 medical students, with a slight predominance of female participants. Most students were in the early academic years, particularly first year, and the majority resided in urban areas. In addition, most participants reported a high family income ($>10,000$ SAR), and only a minority reported low income ($<3,000$ SAR) (Table 1).

Figure 1 shows the distribution of sources of information about herbal medicine among students. Family was the predominant source of information regarding herbal medicine, followed by the internet/web, whereas

practitioners and Attar were among the least reported sources.

Table 2 Most participants expressed interest in herbal medicine, and the majority reported previous use of herbal remedies. Inherited beliefs were the most reported reason for using traditional remedies. Many participants reported occasionally avoiding manufactured medicines in favor of herbal remedies. Herbal medicine was mainly used as needed for therapeutic or combined therapeutic and cosmetic purposes. Most participants found herbal medicine to be partially effective, while only a minority reported no effect or treatment failure.

Table 3 shows the association between various factors and herbal medicine use among medical students. There was no significant association between use and gender, academic year, residence, or family income ($p > 0.05$), although higher usage was observed among females and senior students, such as year 5. Similarly, beliefs regarding traditional practices, safety of herbal medicine, and trust in commercial information were not significantly associated with use. However, a statistically significant association was found with interest in herbal medicine, where students expressing interest were more likely to use herbal medicine compared to those not interested ($p = 0.019$).

Table 4 shows the results of multivariate logistic regression analysis assessing sociodemographic predictors of herbal medicine use. None of the variables demonstrated a statistically significant association with herbal medicine use ($p > 0.05$). Gender showed slightly lower odds among males than among females (OR = 0.904, $p = 0.740$), while academic year showed a non-

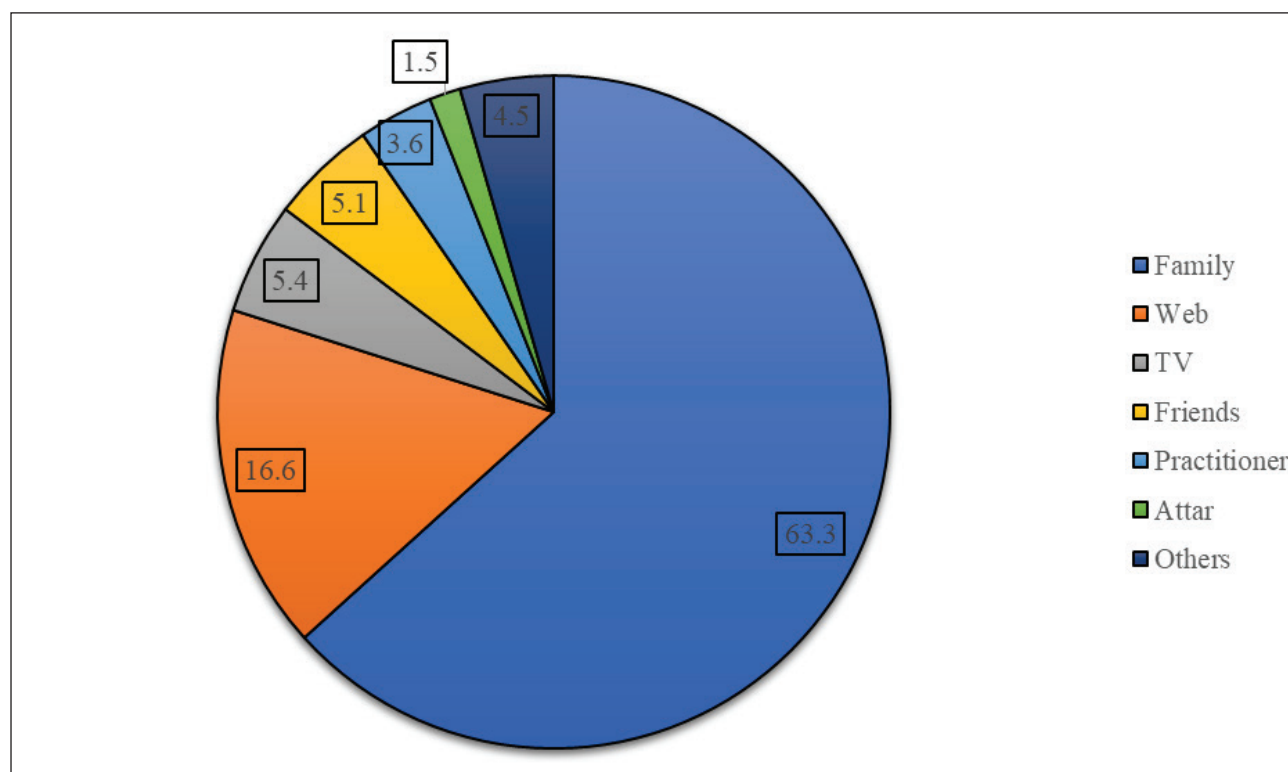


Figure 1. Source of information about herbal medicine.

Table 1. Sociodemographic characteristics of King Faisal University medical students.

Frequency N (%)		
Gender	Female	176 (53.0)
	Male	156 (47.0)
Academic year	Year 1	156 (47.0)
	Year 2	25 (7.5)
	Year 3	58 (17.5)
	Year 4	63 (19.0)
	Year 5	30 (9.0)
Residence	Urban (City)	254 (76.5)
	Rural (Village)	78 (23.5)
Family income	<3,000 SAR	25 (7.5)
	3,000-10,000 SAR	88 (26.5)
	>10,000 SAR	219 (66.0)

(N) Frequency, (%) Percentages.

Table 2. Herbal medicine use, perceptions, and influencing factors among medical students.

Frequency N (%)		
Are you interested in herbal medicine?	Yes	181 (54.5)
	No	151 (45.5)
Have you ever used herbal medicine?	Yes	273 (82.2)
	No	59 (17.8)
What is the reason of using traditional recipes in your point of view?	Inherited beliefs	203 (61.1)
	Not confident in industrial medicine	53 (16.0)
	Others	76 (22.9)
Does using herbs keep you from taking manufactured medicine?	No	139 (41.9)
	Sometimes	142 (42.8)
	Yes	51 (15.4)
What do you think is the correct description of herbal medicine?	Experience	148 (44.6)
	Inherited	146 (44.0)
	Other	38 (11.4)
Do you think herbal medicines are safer than manufactured medicine?	No	140 (42.2)
	Yes	112 (33.7)
	Don't know	80 (24.1)
Do you trust the published information on herbal medicine in commercial channels?	No	149 (44.9)
	Neutral	120 (36.1)
	Yes	63 (19.0)
What is your reason of using herbal medicine?	Therapeutic	140 (42.2)
	Cosmetic	30 (9.0)
	Both	137 (41.3)
	Other	25 (7.5)
What is your frequency of use?	As needed	272 (81.9)
	Daily	32 (9.6)
	Weekly	28 (8.4)
How was the effectiveness of the herbal medicines?	No effect	31 (9.3)
	Partially successful	206 (62.0)
	Successful	73 (22.0)
	Failure	22 (6.6)
Have you used herbal medicine on your children?	Don't have children	268 (80.7)
	Never used	39 (11.7)
	Used once	14 (4.2)
	Used many times	11 (3.3)

(N) Frequency, (%) Percentages.

Table 3. Factors associated with herbal medicine use among medical students (bivariate analysis).

		Ever used herbal medicines		χ^2	Sig. value
		No N (%)	Yes N (%)		
Gender	Female	29 (16.5)	147 (83.5)	0.429	0.512 ^a
	Male	30 (19.2)	126 (80.8)		
Academic year	Year 1	29 (18.6)	127 (81.4)	5.779	0.216 ^b
	Year 2	4 (16.0)	21 (84.0)		
	Year 3	15 (25.9)	43 (74.1)		
	Year 4	9 (14.3)	54 (85.7)		
	Year 5	2 (6.7)	28 (93.3)		
Residence	Rural	14 (17.9)	64 (82.1)	0.002	0.963 ^a
	Urban	45 (17.7)	209 (82.3)		
Family income	<3,000 SAR	6 (24.0)	19 (76.0)	1.074	0.584 ^a
	3,000-10,000 SAR	17 (19.3)	71 (80.7)		
	>10,000 SAR	36 (16.4)	183 (83.6)		
Are you interested in herbal medicine?	No	35 (23.2)	116 (76.8)	5.543	0.019 ^a
	Yes	24 (13.3)	157 (86.7)		
What is the reason of using traditional recipes in your point of view?	Not confident	14 (26.4)	39 (73.6)	4.155	0.125 ^a
	Inherited beliefs	30 (14.8)	173 (85.2)		
	Others	15 (19.7)	61 (80.3)		
Does using herbs keep you from taking manufactured medicine?	No	26 (18.7)	113 (81.3)	0.682	0.711 ^a
	Sometimes	26 (18.3)	116 (81.7)		
	Yes	7 (13.7)	44 (86.3)		
What do you think is the correct description of herbal medicine?	Experience	31 (20.9)	117 (79.1)	4.191	0.123 ^a
	Inherited	19 (13.0)	127 (87.0)		
	Other	9 (23.7)	29 (76.3)		
Do you think herbal medicines are safer than manufactured medicine?	No	27 (19.3)	113 (80.7)	5.089	0.079 ^a
	Yes	13 (11.6)	99 (88.4)		
	Don't know	19 (23.8)	61 (76.3)		
Do you trust the published information on herbal medicine in commercial channels?	No	27 (18.1)	122 (81.9)	0.194	0.908 ^a
	Neutral	22 (18.3)	98 (81.7)		
	Yes	10 (15.9)	53 (84.1)		

(a) Chi-Square Test, (b) Fisher's Exact Test.

Table 4. Binary logistic regression analysis of sociodemographic predictors of herbal medicine use (multivariate analysis).

	B	S.E.	Sig.	Exp(B)	95% CI
Gender	-0.101	0.305	0.740	0.904	0.497-1.642
Academic year	0.094	0.108	0.384	1.099	0.889-1.358
Residence	-0.040	0.345	0.907	0.960	0.489-1.887
Family income	0.214	0.222	0.334	1.239	0.802-1.913
Constant	0.890	0.813	0.274	2.435	—

significant increasing trend in use (OR = 1.099, p = 0.384). Residence also showed no meaningful effect, with similar odds between urban and rural students (OR = 0.960, p = 0.907). Likewise, family income was not significantly associated with use (OR = 1.239, p = 0.334).

Table 5 shows the results of multivariate logistic regression analysis examining belief-related factors influencing herbal medicine use. Only interest in herbal medicine was a significant predictor, with students who were interested 1.966 times more likely to use herbal medicine (OR = 1.966, 95% CI: 1.070-3.610; p = 0.029).

All other variables, including reason for traditional use, perception that herbs prevent modern medicine, description of herbal medicine, perceived safety, and trust in commercial information, were not statistically significant (p > 0.05). Although some variables showed positive or negative trends, they were not significant.

Figure 2 shows a significant association between herbal medicine use and source of information (p < 0.001). Percentages represent the proportion of users within each source category. Family was the most influential source, with 89.5% reporting use, followed by TV and the web.

Table 5. Binary logistic regression analysis of beliefs influencing herbal medicine use (multivariate analysis).

	B	S.E.	Wald	Sig.	Exp(B)	95% CI
Interest in herbal medicine (Yes)	0.676	0.310	4.751	0.029	1.966	1.070-3.610
Reason for traditional use (Inherited beliefs vs non-confidence)	0.103	0.240	0.183	0.668	1.108	0.693-1.773
Herbs prevent modern medicine (Yes)	0.082	0.222	0.135	0.713	1.085	0.702-1.677
Description of herbal medicine (Inherited vs. Experienced)	0.177	0.223	0.631	0.427	1.194	0.771-1.847
Herbal medicine safer (Yes)	-0.114	0.185	0.377	0.539	0.892	0.621-1.283
Trust commercial information (Yes)	-0.011	0.208	0.003	0.958	0.989	0.658-1.486
Constant	1.022	0.396	6.652	0.010	2.779	—

Bold values indicate statistically significant results ($p < 0.05$).

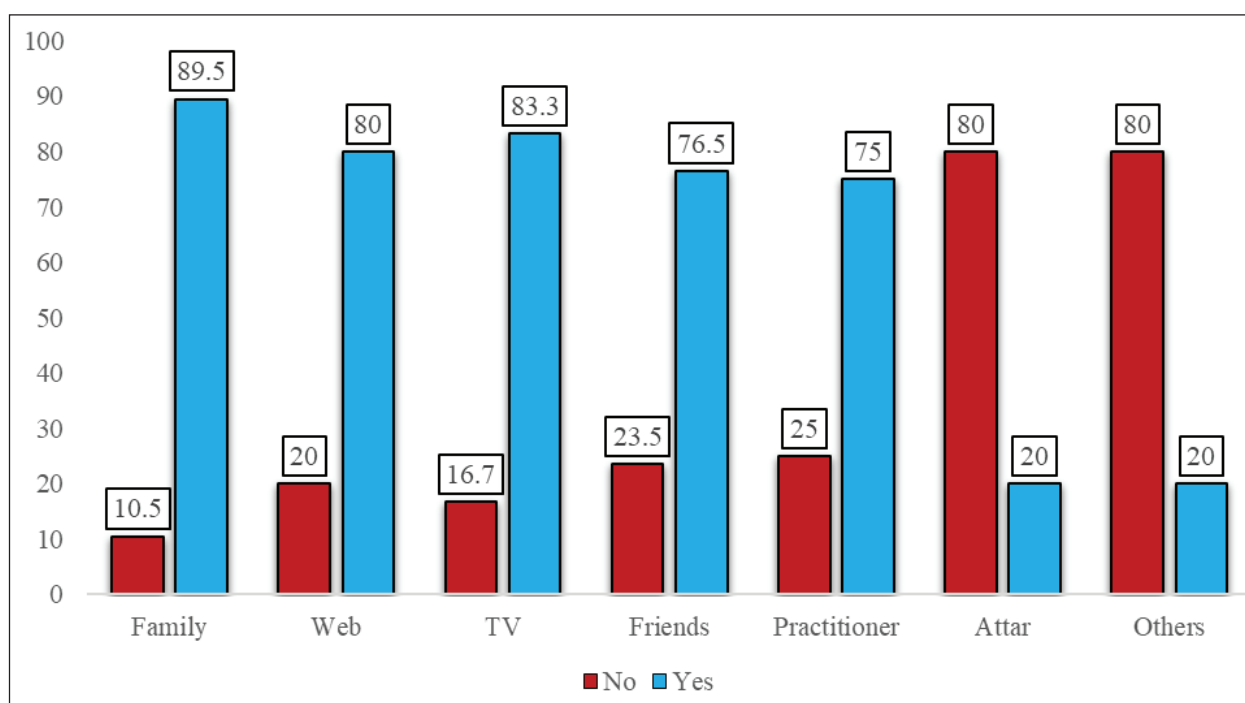


Figure 2. Use of herbal medicines based on the source of information ($p < 0.001$).

Lower usage was observed among practitioners and friends. On the contrary, Attar and other sources showed higher non-use.

Discussion

The data suggest that the majority of medical students (54.5%) are interested in and have previously used (82.2%) herbal medicine for both therapeutic and cosmetic reasons, despite being taught modern medicine exclusively. There was no association between use, gender, academic year, residence, or family income, indicating a deeply embedded cultural source.

The study shows that family was the most influential source, supporting the idea that culture influences health behaviors even among medical students.

41.9% of students reported that they sometimes avoid manufactured medicine in favor of herbs. In addition, 33.7% of medical students think that herbal medicine is safer than manufactured drugs. Interestingly, higher usage was observed among 5th-year students with advanced

knowledge of modern medicine, further emphasizing the cultural influence on medical students.

These results align well with multiple previous studies conducted in various regions. In 2025, a study conducted at Umm Al Qura Medical College, King Abdulaziz Medical College, and Batterjee Medical College reported a high use rate of herbal medicine (94.4%) [12]. Internationally, a study at the University for Development Studies in Ghana demonstrated that 54.7% of medical students had used herbal medicine previously [8].

On the contrary, some regions showed lower rates of herbal medicine use. A study done in 2021 at King Abdulaziz University for Health Sciences demonstrated that (79.2%) of students had not used herbal medicines before [10]. In addition, a 2025 study published at the University of Kufa in Iraq showed that 67.6% of its students had no prior use of herbal medicine [13]. These variations indicate that culture exerts different influences on health behaviors across regions. Socioeconomic level

and health care access might also be influences on the prevalence of herbal medicine use.

Even though the present study indicates higher usage rates of herbal medicine, most of the students who have children prefer to avoid using herbal medicine on their children (11.7%). A similar conclusion was reached by a study done at King Abdulaziz University for Health Sciences in 2021, which showed that (67.1%) of the students did not prefer to use the herbal medicines on their family members [10]. This may indicate some concerns about safety and proper dosing.

The high prevalence noted in this study can be attributed to multiple factors. Particularly, culture and religion. Dating back to the 6th and 7th centuries, when Arab physicians began adopting Greek herbal medical knowledge [14]. In addition, religious practices play a significant role. As Islam originated in the Gulf, where Arabs originate, a lot of practices were taught by Prophet Mohammed that use natural substances recommended for healing and preventing diseases. This includes black seed (*Nigella sativa*), Ajwa dates, and honey. A hadith narrated by Abu Huraira and reported in Sahih al-Bukhari states that the Prophet Muhammad (peace be upon him) said, "There is healing in black cumin for all diseases except death" [15]. These cultural and religious factors have rooted the practice and reliance on herbal medicine in Arabic medical students, which may persist even with modern medicine teaching.

The findings of the current study suggest the need to incorporate herbal medicine teaching into medical curricula. More than half of the study group (54.5%) showed interest in herbal medicine. In addition, teaching herbal medicine, considering the high usage rates, would promote safer health practices. It will also reduce the risk of adverse effects and drug-herb interactions. In addition, it will encourage research in this field, contributing to the development of new therapeutic options. This study has several limitations. First, because of the wide variety of herbs used in the region, the most commonly used herbs among participants could be studied. In addition, the study did not assess the specific types of herbs used, the frequency or dosage of herbal medicine consumption, or any possible side effects linked to their use. Second, conducting the study at a single university limits the generalizability of the findings to all medical students in the Eastern Region of Saudi Arabia. Furthermore, convenience sampling was used, which may have introduced selection bias and affected the sample's representativeness. Finally, other influencing factors that might affect herbal medicine use, like cultural beliefs, family practices, health status, and access to healthcare services, were not assessed in this study, which may have affected the results.

Conclusion

As medical colleges have shifted their focus to modern medicine teaching, the prevalence of traditional herbal medicine use among medical students has become an important area for investigation. This study concluded that herbal medicine is still widely used among medical students. This can be attributed to the cultural and

religious influences within Arabic society, where natural resources are deeply integrated into health practices. These findings highlight the need to incorporate herbal medicine education into the curricula to promote patient safety. Further research is recommended to explore the commonly used herbs, their side effects, and potential herb-drug interactions.

List of Abbreviations

CI	Confidence interval
Exp(B)	Exponentiated Regression Coefficient (Odds Ratio)
IBM	International Business Machines
OR	Odds ratio
SAR	Saudi Riyal
SPSS	Statistical Package for the Social Sciences
TV	Television

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Conflict of interests

The authors declare that there is no conflict of interest regarding the publication of this article.

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Consent to participate

Written informed consent was obtained from all the participants.

Ethical approval

Ethical approval was granted by the Ethics Committee via ethical clearance number KFUEC-2026-MAY-ETHICS4242 dated 03/05/2026.

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Supplementary content (If any) is available online.

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