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Prevalence, patterns, and perceptions of self medication using conventional and herbal medicines among ENT patients in Bisha, Saudi Arabia

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ABSTRACT

Background: Self-medication (SM) is a prevalent global health concern that can offer convenience and quick relief for minor ailments, but it also poses risks such as incorrect diagnosis, drug interactions, and adverse effects when not properly guided. This study aimed to assess the prevalence, patterns, and perceptions of SM using conventional and herbal medicines among ear, nose, and throat patients in Bisha, Saudi Arabia.

Methods: A descriptive cross-sectional study was conducted among adult residents of Bisha, Saudi Arabia, from February to July 2025, using an online, self-administered questionnaire. The sample size was calculated using a single-proportion formula. Data were analyzed using SPSS (version 27; IBM Corp., Armonk, NY). Descriptive and inferential statistics, including chi-square tests and binary logistic regression, were applied, with significance set at $p < 0.05$.

Results: Among 422 respondents, a high prevalence of SM was reported, with 83% of participants using conventional or herbal remedies without medical consultation. Analgesics were the most commonly used pharmaceutical, while 65.1% reported using herbal medicines, particularly ginger (69.5%) and lemon (61.1%), to manage symptoms like cold, sore throat, and cough. Despite widespread use, awareness of potential risks was limited; 59.9% were either unaware or unsure about adverse effects and herb-drug interactions. The internet (52%) and social circles (46%) were the primary sources of information, while only a third consulted healthcare professionals. Inferential analysis showed no significant association between SM practices and sociodemographic variables ($p > 0.05$), indicating that SM is uniformly practiced across the population.

Conclusion: SM is a common and culturally embedded behavior in the Bisha community. The high reliance on non-professional sources and low awareness of risks associated with herbal remedies underline the need for comprehensive public health education targeting the entire population to promote safe medication practices.

Keywords: Self-medication, conventional medicines, herbal medicines, ENT patients, Bisha, Saudi Arabia.

Introduction

Self-medication (SM), defined as the selection and use of medicines by individuals to treat self-recognized illnesses or symptoms without consulting a healthcare professional, represents one of the most common forms of healthcare-seeking behavior worldwide [1]. The World Health Organization has acknowledged that responsible SM can contribute to the efficiency of healthcare

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systems by reducing the burden on formal medical services; however, irresponsible or uninformed SM poses significant risks, including misdiagnosis, delayed appropriate treatment, drug interactions, antimicrobial resistance, and adverse drug reactions [2]. The global prevalence of SM varies considerably, with studies reporting rates ranging from 32.5% to 81.5% depending on the population studied, the definition applied, and the cultural context [3].

In the context of ear, nose, and throat (ENT) conditions, SM is particularly relevant because many ENT symptoms, such as the common cold, sore throat, nasal congestion, and ear pain, are often perceived as minor and self-limiting, prompting individuals to seek over-the-counter remedies or traditional treatments before consulting a physician [4]. A systematic review by Fekadu et al. [5] reported that SM practices among healthcare professionals alone reached rates as high as 77.6% in certain settings, suggesting that the practice is deeply ingrained even among those with medical knowledge. The use of analgesics, antibiotics, and decongestants without prescription is common, and inappropriate antibiotic use for viral ENT infections is a recognized contributor to the growing global challenge of antimicrobial resistance [6].

Herbal medicine use is a particularly important dimension of SM in many Middle Eastern and developing countries, where cultural traditions and historical practices strongly influence health-seeking behavior [7]. In Saudi Arabia, the use of herbal and traditional remedies has deep cultural roots, with products such as ginger, black seed (*Nigella sativa*), honey, and myrrh being commonly used for respiratory and ENT complaints [8]. A cross-sectional study conducted among the general public in Saudi Arabia by Ali et al. [9] found that 70% of respondents considered herbal remedies to be safe, yet only 35% consulted healthcare professionals before using them. This discrepancy between perceived safety and professional guidance represents a significant public health concern, particularly given the potential for herb-drug interactions and the lack of regulatory oversight for many herbal products.

Several recent studies have examined SM patterns in Saudi Arabia. Al-Qahtani et al. [10] reported a SM prevalence of 60% among undergraduate medical students at Najran University, with antibiotics being the most commonly used medication. However, there remains a paucity of data specifically addressing SM practices among ENT patients in the Bisha region of Saudi Arabia, a semi-urban community in the southwestern part of the country where access to specialist ENT services may be limited and cultural practices favoring self-care are prevalent. Understanding the prevalence, patterns, and perceptions of SM, both with conventional and herbal medicines, in this specific population is essential for designing targeted public health interventions and educational programs.

This study therefore aimed to assess the prevalence, patterns, and perceptions of SM using conventional and herbal medicines among ENT patients in Bisha, Saudi Arabia. The specific objectives were to determine the prevalence of SM with conventional and herbal remedies, identify the types of medications and herbal products commonly used, examine the sources of information guiding SM practices, assess perceptions regarding the effectiveness and safety of herbal remedies, and investigate the sociodemographic factors associated with SM behaviors.

Methods

Study design and setting

A descriptive cross-sectional study was conducted among adult residents of Bisha, Saudi Arabia. Bisha is a city located in the Asir Province in the southwestern part of Saudi Arabia, with a population that includes both urban and semi-urban communities. The study was conducted over 6 months from February to July 2025. This design was chosen as it is appropriate for determining the prevalence of SM practices and examining associated factors at a specific point in time.

Study population

The target population comprised adult residents of Bisha, Saudi Arabia. The inclusion criteria were adults aged 18 years or older, current residents of Bisha, and individuals who provided informed consent to participate in the study. The exclusion criteria were non-residents of Bisha, individuals below 18 years of age, and those unable to complete the questionnaire due to language barriers or cognitive impairment.

Sampling technique

A convenience sampling technique was employed to recruit participants. The online questionnaire was distributed through multiple channels, including social media platforms (such as WhatsApp groups, Twitter, and Snapchat), community forums, and electronic communication channels associated with local healthcare facilities in Bisha. This approach was selected to maximize reach and response rates in a population that is widely dispersed and has high social media usage. While convenience sampling limits generalizability, it is a practical and commonly used approach for online survey-based research in the Saudi context.

Sample size calculation

The sample size was determined using a single-proportion formula for cross-sectional studies: $n = Z^2pq/d^2$, where $Z = 1.96$ (corresponding to the 95% confidence level), $p = 0.50$ (expected proportion of SM, chosen to maximize the sample size in the absence of a prior local estimate), $q = 0.50$ (1 - p), and $d = 0.05$ (margin of error). This calculation yielded a minimum required sample size of 384 participants. To account for potential non-response and incomplete questionnaires, an additional 10% was added, bringing the target sample size to 422 participants.

Questionnaire development

The data collection instrument was a structured, self-administered questionnaire developed in English and translated into Arabic for broader accessibility. The questionnaire was adapted from previously validated

instruments used in similar studies on SM in Saudi Arabia and the Middle East [5,10]. It comprised four main sections: (1) sociodemographic characteristics (age, sex, nationality, marital status, education level, and monthly income); (2) SM practices with conventional medicines (prevalence, types of medications used, sources of information, and disposal of leftover medications); (3) SM practices with herbal medicines (prevalence, types of herbal remedies used, purposes of use, and sources of information); and (4) perceptions regarding the effectiveness and safety of herbal remedies for ENT conditions. Most items were closed-ended with predefined response options. The questionnaire was reviewed for content validity by two experts in public health and pharmacy practice, and a pilot test was conducted with 20 participants to assess clarity, comprehension, and reliability. Minor modifications were made to the wording of two questions based on pilot feedback. The pilot data were not included in the final analysis.

Data collection

Data were collected through an online, self-administered questionnaire hosted on Google Forms. The survey link was distributed via social media platforms and electronic communication channels over the data collection period from February to July 2025. Participants were provided with an information sheet at the beginning of the survey explaining the purpose of the study, the voluntary nature of participation, and the confidentiality of responses. Informed consent was obtained electronically before participants could proceed to the questionnaire. To ensure data quality, mandatory response fields were used for key variables, and the survey was designed to prevent duplicate submissions from the same electronic device. A total of 422 completed responses were received and included in the analysis.

Statistical analysis

Data were exported from Google Forms, cleaned, and analyzed using SPSS (version 27; IBM Corp., Armonk, NY). Descriptive statistics, including frequencies, percentages, means, and standard deviations, were used to summarize the sociodemographic characteristics and SM practices. Categorical variables were compared using the chi-square test. Binary logistic regression was performed to identify factors associated with the perceived effectiveness of herbal treatment for ENT diseases. The dependent variable was the perceived effectiveness of herbal treatment, which was dichotomized as "Effective" (respondents who selected "Effective") versus "Not effective/Not sure" (respondents who selected "Ineffective" or "Not sure"). The independent variables entered into the model were age, sex, marital status, education level, monthly income, and source of information about herbal medicine, using the enter method. The nationality variable was excluded from the logistic regression model because 99.5% of participants were Saudi nationals, resulting in near-zero variability that would produce unreliable estimates. Normality of continuous variables was assessed using the Shapiro-Wilk test. Missing data were minimal (less than 2% for any variable) and were handled using listwise deletion. A p-value of less than 0.05 was considered statistically significant for all analyses.

Ethical approval

Ethical approval was obtained from the Institutional Review Board (IRB) of the University of Bisha prior to the commencement of the study (IRB Reference Number: UB-REC-2025-XX). All participants provided informed consent electronically before completing the questionnaire. Participation was entirely voluntary, and respondents were free to withdraw at any time without any consequences. All data were collected anonymously and stored securely, with access restricted to the research team. The study was conducted in accordance with the Declaration of Helsinki and the national ethical guidelines of Saudi Arabia.

Results

A total of 422 participants completed the survey. The sample was predominantly composed of young adults, with the largest age group being 18-30 years, followed by the 41-50 year age group. Females constituted the majority of respondents, and nearly all participants were Saudi nationals. Most participants were married and held a bachelor's degree. Monthly income was relatively evenly distributed, with the largest proportion earning less than 5,000 SAR. The baseline sociodemographic characteristics are summarized in Table 1.

The prevalence of SM with conventional drugs was high, with a combined 77.7% of participants reporting that they engaged in SM either always or sometimes, while only 22.3% completely avoided SM (Figure 1). Among the specific conventional medications used, pain relievers were by far the most commonly reported, followed by nasal sprays and flu/cold medicines. Notably, 16.5% of respondents reported using antibiotics without a prescription, which is a concerning finding given the global threat of antimicrobial resistance (Figure 2).

Figure 1 shows the distribution of SM prevalence with conventional drugs, with the majority of respondents reporting engagement in SM either always or sometimes.

Figure 2 illustrates the types of conventional medications used for SM, with analgesics being the most frequently reported category, followed by nasal sprays and flu/cold medicines. Antibiotic use without prescription was reported by 16.5% of respondents.

Regarding sources of information about conventional medicines used for ENT treatment, doctors were the most frequently cited source, followed by pharmacists and the internet. However, the combined influence of non-professional sources, including the internet and advice from neighbors, relatives, or friends, was substantial. In terms of medication disposal, the majority of respondents kept leftover medications at home, which raises concerns about inappropriate future use. These findings are detailed in Table 2.

Table 1. *Baseline sociodemographic characteristics of the study population.*

Variable	Category	*n* (%)
Age	18-30 years	162 (38.4)
	31-40 years	74 (17.5)
	41-50 years	131 (31.0)
	>50 years	55 (13.0)
Sex	Female	260 (61.6)
	Male	162 (38.4)
Nationality	Saudi	420 (99.5)
	Non-Saudi	2 (0.5)
Marital status	Married	265 (62.8)
	Single	143 (33.9)
	Divorced	11 (2.6)
	Widowed	3 (0.7)
Education level	Bachelor's degree	307 (72.7)
	High school or less	88 (20.9)
	Postgraduate studies	27 (6.4)
Monthly income (SAR)	<5,000	150 (35.5)
	5,000-10,000	117 (27.7)
	11,000-15,000	65 (15.4)
	>15,000	90 (21.3)

SAR, Saudi Riyal.

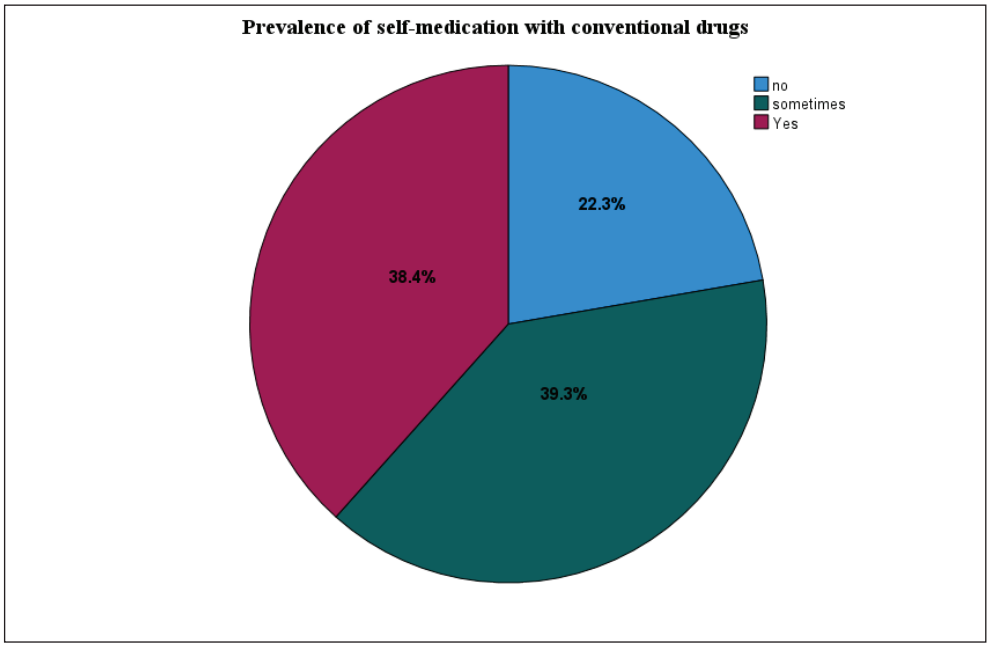

Figure 1. *Prevalence of SM with conventional drugs.*

Herbal medicine use was also highly prevalent, with 65.1% of respondents reporting either regular or occasional use of herbal remedies for ENT problems. Ginger and lemon/citrus were the most commonly used herbal products, followed by mint, garlic, and green tea. Less commonly used herbs included turmeric, fennel, sage, linden, and chrysanthemums (Figure 3). The primary reasons for herbal medicine use were to treat the common cold and sore throat, followed by cough, disease prevention, and strengthening immunity. The dominant source of information about herbal medicine was advice from neighbors, relatives, or friends, followed by the internet, with only a small proportion of respondents consulting qualified healthcare professionals. These findings are presented in Table 3.

Figure 3 depicts the types of herbal medications used for SM, with ginger (69.5%) and lemon/citrus (61.1%) being the most commonly reported, followed by mint, garlic, and green tea.

Perceptions regarding the effectiveness and safety of herbal remedies for ENT conditions were mixed. While nearly

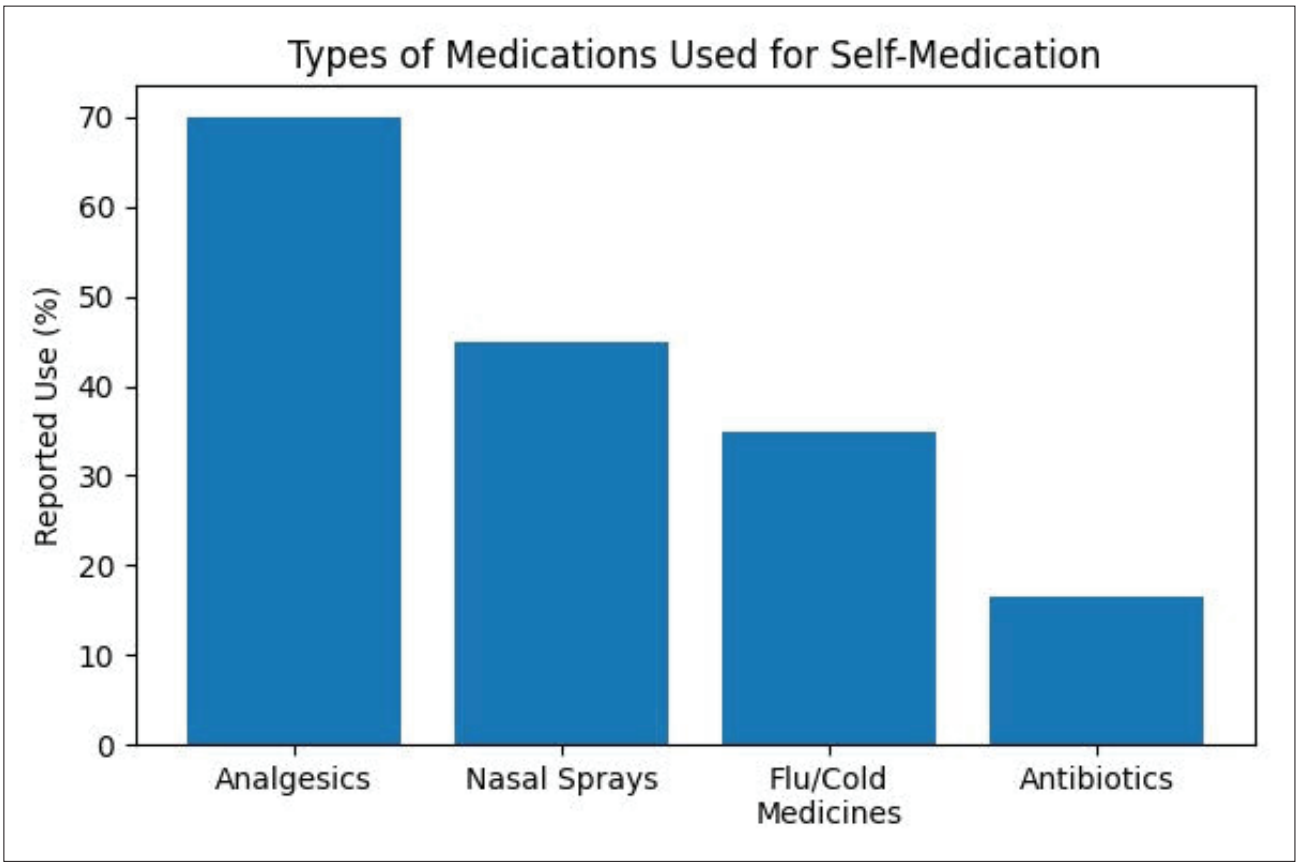

Figure 2. *Types of medications used for SM among ENT patients in Bisha.*

Table 2. *SM practices with conventional medicines.*

Question	Category	*n* (%)
Source of information about medicine used for ENT treatment	Doctor	194 (46.0)
	Pharmacist	121 (28.7)
	Internet	104 (24.6)
	Pharmaceutical sources	80 (19.0)
	Neighbor/relative/friend	80 (19.0)
	Other	53 (12.6)
	Medicine leaflet	28 (6.6)
Disposal of leftover medications	Kept at home	286 (67.8)
	Thrown in the trash	83 (19.7)
	Not enough medication for leftovers	38 (9.0)
	Given to relatives/friends	7 (1.7)
	Given to family doctor	4 (0.9)
	Returned to pharmacy	4 (0.9)

ENT, ear, nose, and throat. Multiple responses were possible for sources of information.

half of the participants believed herbal treatments were effective, a substantial proportion were unsure. Regarding awareness of potential interactions between herbal products and other medications, just over half acknowledged the possibility, but nearly a third were unaware. Similarly, while a majority indicated awareness of potential side effects of herbal products, a notable proportion reported no awareness. These findings are detailed in Table 4.

The binary logistic regression analysis revealed that none of the examined sociodemographic variables demonstrated a statistically significant association with the perceived effectiveness of herbal treatment for ENT diseases (Table 5). Age, sex, marital status, education level, monthly income, and source of information about herbal medicine all showed adjusted odds ratios close to 1.00, with wide confidence intervals crossing the null value and *p*-values well above 0.05. It is important to note that the nationality variable was excluded from the regression model due to the extremely low variability (99.5% Saudi nationals), which would have produced

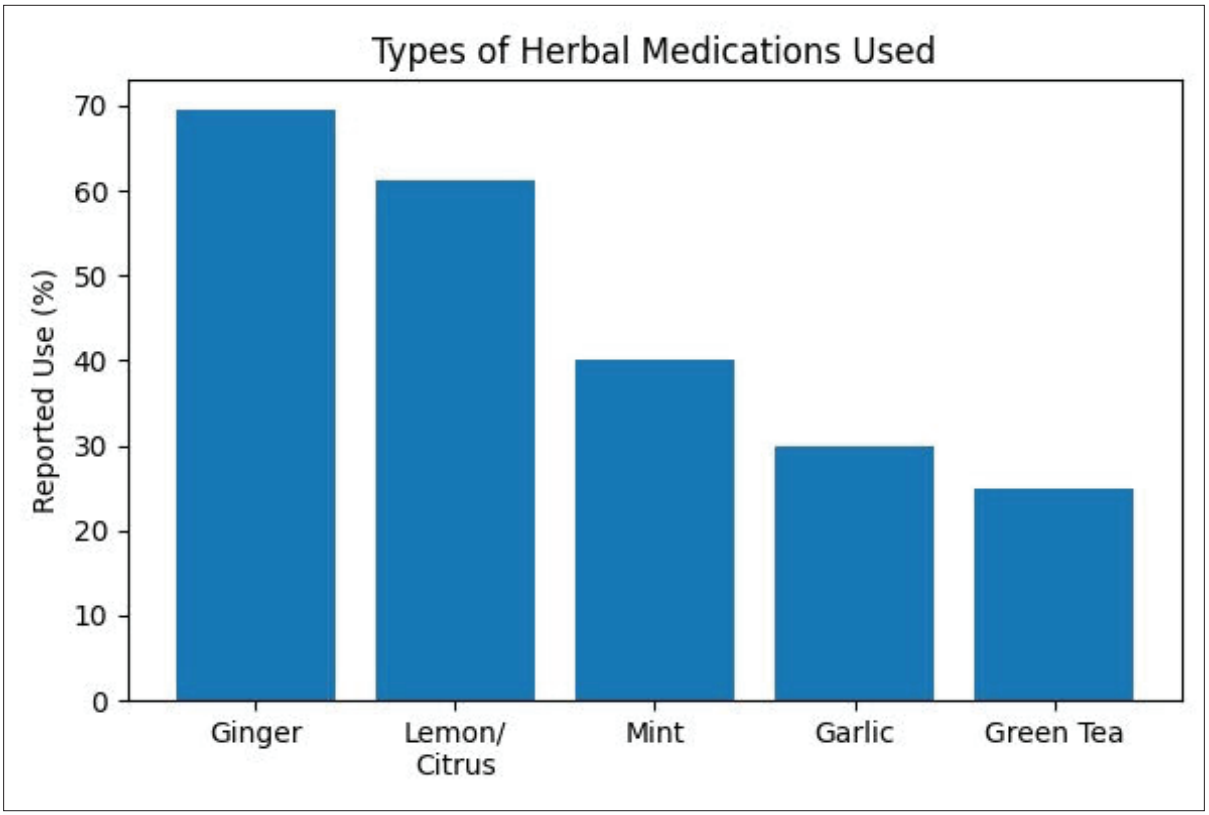

Figure 3. *Types of herbal medications used for SM among ENT patients in Bisha.*

Table 3. *SM practices with herbal medicines.*

Question	Category	*n* (%)
Use of herbal medicine for ENT problems	Yes (regularly)	169 (40.0)
	Sometimes	106 (25.1)
	No	147 (34.8)
Purpose of herbal medicine use	Common cold	305 (72.3)
	Sore throat	187 (44.3)
	Cough	140 (33.2)
	Disease prevention	130 (30.8)
	Strengthening immunity	116 (27.5)
	Relaxation	89 (21.1)
	Fever	64 (15.2)
	Weight problems	54 (12.8)
	Headache	48 (11.4)
	Shortness of breath	35 (8.3)
	General well-being	12 (2.8)
	Public welfare	5 (1.2)
Source of information about herbal medicines	Neighbor/relative/friend	193 (45.7)
	Internet	142 (33.6)
	Healthcare professional	47 (11.1)
	Media (TV, newspaper)	32 (7.6)
	Books/magazines	8 (1.9)

ENT, ear, nose, and throat. Multiple responses were possible for purposes and sources of information.

unreliable estimates with an adjusted odds ratio near zero and an extremely wide confidence interval.

Discussion

This study provides a comprehensive assessment of SM practices using both conventional and herbal medicines among ENT patients in Bisha, Saudi Arabia. The key findings indicate a remarkably high prevalence of SM, with 83% of participants reporting the use of conventional or herbal remedies without medical consultation. Analgesics were the most frequently used conventional medications, while herbal remedies, particularly ginger and lemon, were used by nearly two-thirds of respondents.

Table 4. *Perceptions regarding the effectiveness and safety of herbal remedies for ENT conditions.*

Question	Category	*n* (%)
Perceived effectiveness of herbal treatment for ENT diseases	Effective	203 (48.1)
	Not sure	186 (44.1)
	Ineffective	33 (7.8)
Awareness of herbal product-drug interactions	Yes	223 (52.8)
	Sometimes	74 (17.5)
	No	125 (29.6)
Awareness of herbal product side effects	Yes	245 (58.1)
	Sometimes	79 (18.7)
	No	98 (23.2)

ENT, ear, nose, and throat.

Table 5. *Factors associated with perceived effectiveness of herbal treatment for ENT diseases.*

Variable	AOR	95% CI	*p*-value
Age	1.01	0.846-1.202	0.929
Sex	1.18	0.795-1.744	0.415
Marital status	0.99	0.699-1.397	0.945
Education level	1.01	0.692-1.482	0.947
Monthly income	1.06	0.896-1.254	0.495
Source of information about herbal medicine	1.06	0.874-1.277	0.567

AOR, adjusted odds ratio; CI, confidence interval; ENT, ear, nose, and throat. Nationality was excluded from the model due to near-zero variability (99.5% Saudi nationals). Dependent variable: perceived effectiveness of herbal treatment (Effective *vs*. Ineffective/Not sure). Significant at $p < 0.05$.

Despite this widespread use, awareness of the potential risks associated with herbal remedies, including adverse effects and herb-drug interactions, was notably low, with approximately 60% of participants being either unaware or uncertain. Non-professional sources, particularly the internet and social circles, were the primary sources of guidance, and no sociodemographic variable was significantly associated with SM practices, suggesting that this behavior is pervasive across all demographic groups in the Bisha community.

The prevalence of SM observed in this study (83%) is higher than the 60% reported by Al-Qahtani et al. [10] among medical students at Najran University, but is consistent with the broader range of 32.5%-81.5% reported in global systematic reviews [3]. The higher prevalence in our study may reflect the inclusion of both conventional and herbal SM, as well as the fact that our sample was drawn from the general community rather than medical students who may have greater awareness of the risks of SM. The predominance of analgesics as the most commonly used conventional medication aligns with findings from multiple studies in the Middle East and globally, where pain relief is consistently the primary reason for SM [5,11]. However, the 16.5% rate of antibiotic use without prescription in our sample is particularly concerning and is comparable to rates reported in other Saudi studies, highlighting the ongoing challenge of inappropriate antibiotic use that contributes to antimicrobial resistance [6].

The high prevalence of herbal medicine use (65.1%) is consistent with regional trends. Ali et al. [9] reported that herbal medicine use is widespread in Saudi Arabia, with 70% of their sample considering herbal remedies safe. The preference for ginger and lemon in our study mirrors global patterns of herbal remedy use for respiratory and ENT conditions, as documented by Wardani et al. [12], who reviewed the scientific evidence supporting the use of ginger, peppermint, and liquorice for the common cold. The finding that neighbors, relatives, and friends were the primary source of information about herbal medicines (45.7%), rather than healthcare professionals (11.1%), is consistent with the broader literature on traditional medicine use, where knowledge is typically transmitted through informal social networks rather than formal health education channels [7,8].

Several factors may explain the high prevalence of SM and the low reliance on healthcare professionals observed in this study. First, many ENT symptoms, such as the common cold, sore throat, and nasal congestion, are perceived as minor and self-limiting, which may lead individuals to self-treat rather than seek formal medical care. Second, cultural traditions in the Bisha region and broader Saudi society strongly favor the use of herbal and natural remedies, which are often viewed as safe because of their natural origin and long history of traditional use. Third, the ease of access to both over-the-counter conventional medicines and herbal products through pharmacies and local markets, combined with the widespread availability of health information on the internet, has lowered the barriers to SM. The finding that 52% of participants relied on the internet for medication information is consistent with global trends reported by Bergmo et al. [13] and Bujnowska-Fedak [14], who documented the growing role of the internet as a primary source of health information. However, the quality and accuracy of online health information are highly variable,

and reliance on unverified sources may contribute to inappropriate SM practices.

The findings of this study have several important clinical and public health implications. The high prevalence of antibiotic use without prescription underscores the need for stricter enforcement of regulations governing the sale of antibiotics without a valid prescription, as well as public education campaigns about the risks of inappropriate antibiotic use and antimicrobial resistance. The widespread use of herbal remedies with limited awareness of potential risks highlights the need for community-based educational programs that specifically address the safety concerns associated with herbal medicine, including herb-drug interactions and the importance of disclosing herbal remedy use to healthcare providers. The role of pharmacists as accessible healthcare professionals should be strengthened, as they are well-positioned to guide both conventional and herbal medications. In addition, the finding that the internet and social circles are the primary sources of medication information suggests that digital health literacy interventions and the development of reliable, culturally appropriate online health resources could be effective strategies for improving medication safety in this population. Public health authorities should consider developing targeted educational campaigns that address the entire community, given the absence of significant demographic differences in SM practices.

This study has several strengths, including a reasonable sample size that meets the calculated requirement, the inclusion of both conventional and herbal SM practices, and the focus on a previously understudied population in the Bisha region. However, several limitations should be acknowledged. The cross-sectional design only allows the identification of associations between variables and does not establish causality. The use of an online, self-administered questionnaire does not provide an opportunity to verify responses, potentially introducing response and recall bias. The convenience sampling technique limits the generalizability of the findings to the broader Saudi population. In addition, the near-homogeneity of the sample in terms of nationality (99.5% Saudi) precluded meaningful analysis of the influence of nationality on SM practices and necessitated the exclusion of this variable from the logistic regression model. Finally, social desirability bias may have influenced responses, particularly regarding practices that participants might perceive as inappropriate.

Future research should employ longitudinal designs to examine temporal trends in SM practices and their health outcomes. Qualitative studies are needed to explore the cultural and contextual factors driving SM behavior in greater depth, particularly the decision-making processes that lead individuals to choose herbal over conventional remedies or to combine both without professional guidance. Studies involving clinical assessments of the actual health consequences of SM, including adverse drug reactions, herb-drug interactions, and treatment delays, would provide valuable evidence to inform clinical practice and public health policy. Furthermore, research examining the effectiveness of educational interventions aimed at improving medication safety and health literacy in the Bisha community and similar settings would be highly beneficial. Finally, multicenter studies across different regions of Saudi Arabia would enhance the generalizability of findings and allow for regional comparisons that could inform targeted, context-specific interventions.

Conclusion

This study found a high prevalence of SM practices with both conventional and herbal medicines among ENT patients in Bisha, Saudi Arabia. Analgesics and antibiotics were the most commonly used conventional medications, while ginger and lemon were the predominant herbal remedies. Despite the widespread use of herbal medicines, awareness regarding their potential risks and interactions with conventional drugs was alarmingly low. The majority of respondents relied on the internet and social circles for medication guidance rather than healthcare professionals, which raises significant concerns about the quality and safety of information driving SM behavior. No sociodemographic variable was significantly associated with SM practices, indicating that this is a community-wide phenomenon. These findings underscore the urgent need for broad-based, community-wide public health interventions that focus on improving health literacy, promoting responsible medication use, strengthening the role of pharmacists in patient education, and developing reliable and culturally appropriate health information resources for the public.

List of Abbreviations

AOR	Adjusted odds ratio
CI	Confidence interval
ENT	Ear, nose, and throat
SM	Self-medication
SPSS	Statistical Package for the Social Sciences
WHO	World Health Organization

Conflict of interest

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

Funding

This research received no external funding.

Consent to participate

Written informed consent was obtained from all participants.

Consent for publication

Not applicable, as no individual data requiring consent for publication were included.

Ethical approval

Ethical approval was obtained from the Institutional Review Board/Ethics Committee of King Abdullah Hospital, Bisha, Saudi Arabia (E-CTS Ref No. BIS-24-00022-22102024).

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Supplementary content (If any) is available online.

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