

ORIGINAL ARTICLE

Prevalence, patterns, and perceptions of selfmedication 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 health-care 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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Received: 19 April 2026 | **Revised (1):** 30 May 2026 |

Accepted: 02 June 2026



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44	systems by reducing the burden on formal medical	105
45	services; however, irresponsible or uninformed SM	106
46	poses significant risks, including misdiagnosis, delayed	107
47	appropriate treatment, drug interactions, antimicrobial	108
48	resistance, and adverse drug reactions [2]. The global	
49	prevalence of SM varies considerably, with studies	
50	reporting rates ranging from 32.5% to 81.5% depending	
51	on the population studied, the definition applied, and the	
52	cultural context [3].	
53	In the context of ear, nose, and throat (ENT) conditions,	
54	SM is particularly relevant because many ENT symptoms,	
55	such as the common cold, sore throat, nasal congestion,	
56	and ear pain, are often perceived as minor and self-limiting,	
57	prompting individuals to seek over-the-counter remedies	
58	or traditional treatments before consulting a physician [4].	
59	A systematic review by Fekadu et al. [5] reported that SM	
60	practices among healthcare professionals alone reached	
61	rates as high as 77.6% in certain settings, suggesting that	
62	the practice is deeply ingrained even among those with	
63	medical knowledge. The use of analgesics, antibiotics,	
64	and decongestants without prescription is common, and	
65	inappropriate antibiotic use for viral ENT infections is a	
66	recognized contributor to the growing global challenge of	
67	antimicrobial resistance [6].	
68	Herbal medicine use is a particularly important dimension	
69	of SM in many Middle Eastern and developing countries,	
70	where cultural traditions and historical practices strongly	
71	influence health-seeking behavior [7]. In Saudi Arabia, the	
72	use of herbal and traditional remedies has deep cultural roots,	
73	with products such as ginger, black seed (<i>Nigella sativa</i>),	
74	honey, and myrrh being commonly used for respiratory	
75	and ENT complaints [8]. A cross-sectional study conducted	
76	among the general public in Saudi Arabia by Ali et al. [9]	
77	found that 70% of respondents considered herbal remedies	
78	to be safe, yet only 35% consulted healthcare professionals	
79	before using them. This discrepancy between perceived	
80	safety and professional guidance represents a significant	
81	public health concern, particularly given the potential for	
82	herb-drug interactions and the lack of regulatory oversight	
83	for many herbal products.	
84	Several recent studies have examined SM patterns in Saudi	
85	Arabia. Al-Qahtani et al. [10] reported a SM prevalence	
86	of 60% among undergraduate medical students at Najran	
87	University, with antibiotics being the most commonly	
88	used medication. However, there remains a paucity of	
89	data specifically addressing SM practices among ENT	
90	patients in the Bisha region of Saudi Arabia, a semi-	
91	urban community in the southwestern part of the country	
92	where access to specialist ENT services may be limited	
93	and cultural practices favoring self-care are prevalent.	
94	Understanding the prevalence, patterns, and perceptions	
95	of SM, both with conventional and herbal medicines, in	
96	this specific population is essential for designing targeted	
97	public health interventions and educational programs.	
98	This study therefore aimed to assess the prevalence,	
99	patterns, and perceptions of SM using conventional and	
100	herbal medicines among ENT patients in Bisha, Saudi	
101	Arabia. The specific objectives were to determine the	
102	prevalence of SM with conventional and herbal remedies,	
103	identify the types of medications and herbal products	
104	commonly used, examine the sources of information	
	guiding SM practices, assess perceptions regarding	105
	the effectiveness and safety of herbal remedies, and	106
	investigate the sociodemographic factors associated with	107
	SM behaviors.	108
	Methods	109
	Study design and setting	110
	A descriptive cross-sectional study was conducted among	111
	adult residents of Bisha, Saudi Arabia. Bisha is a city	112
	located in the Asir Province in the southwestern part of	113
	Saudi Arabia, with a population that includes both urban	114
	and semi-urban communities. The study was conducted	115
	over 6 months from February to July 2025. This design	116
	was chosen as it is appropriate for determining the	117
	prevalence of SM practices and examining associated	118
	factors at a specific point in time.	119
	Study population	120
	The target population comprised adult residents of Bisha,	121
	Saudi Arabia. The inclusion criteria were adults aged 18	122
	years or older, current residents of Bisha, and individuals	123
	who provided informed consent to participate in the	124
	study. The exclusion criteria were non-residents of Bisha,	125
	individuals below 18 years of age, and those unable to	126
	complete the questionnaire due to language barriers or	127
	cognitive impairment.	128
	Sampling technique	129
	A convenience sampling technique was employed	130
	to recruit participants. The online questionnaire was	131
	distributed through multiple channels, including social	132
	media platforms (such as WhatsApp groups, Twitter,	133
	and Snapchat), community forums, and electronic	134
	communication channels associated with local healthcare	135
	facilities in Bisha. This approach was selected to	136
	maximize reach and response rates in a population that	137
	is widely dispersed and has high social media usage.	138
	While convenience sampling limits generalizability, it	139
	is a practical and commonly used approach for online	140
	survey-based research in the Saudi context.	141
	Sample size calculation	142
	The sample size was determined using a single-proportion	143
	formula for cross-sectional studies: $n = Z^2pq/d^2$, where Z	144
	$= 1.96$ (corresponding to the 95% confidence level), $p =$	145
	0.50 (expected proportion of SM, chosen to maximize	146
	the sample size in the absence of a prior local estimate),	147
	$q = 0.50$ ($1 - p$), and $d = 0.05$ (margin of error). This	148
	calculation yielded a minimum required sample size of	149
	384 participants. To account for potential non-response	150
	and incomplete questionnaires, an additional 10% was	151
	added, bringing the target sample size to 422 participants.	152
	Questionnaire development	153
	The data collection instrument was a structured, self-	154
	administered questionnaire developed in English and	155
	translated into Arabic for broader accessibility. The	156
	questionnaire was adapted from previously validated	157

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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.

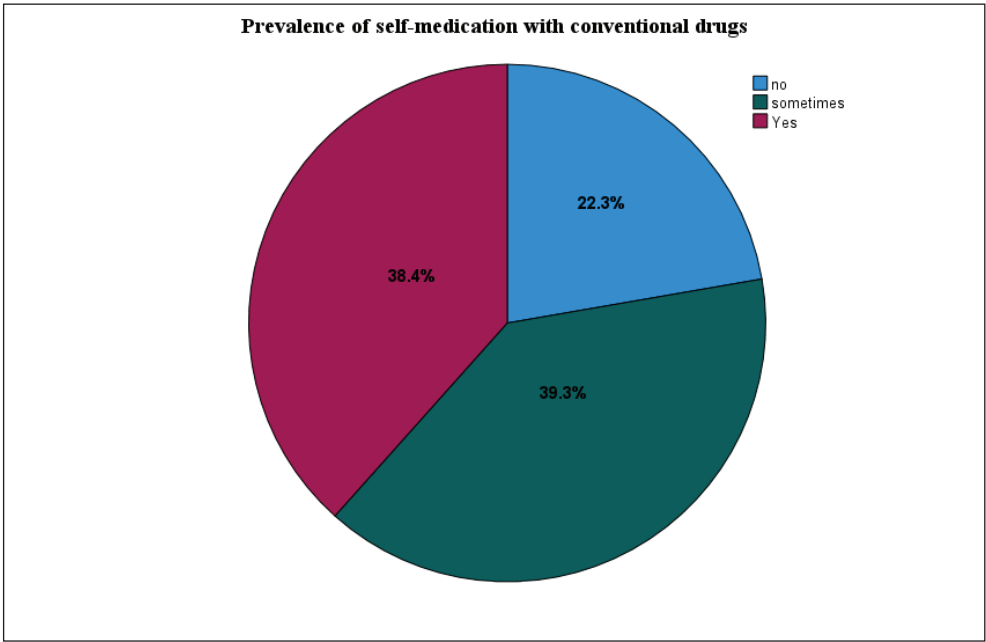


Figure 1. Prevalence of SM with conventional drugs.

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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

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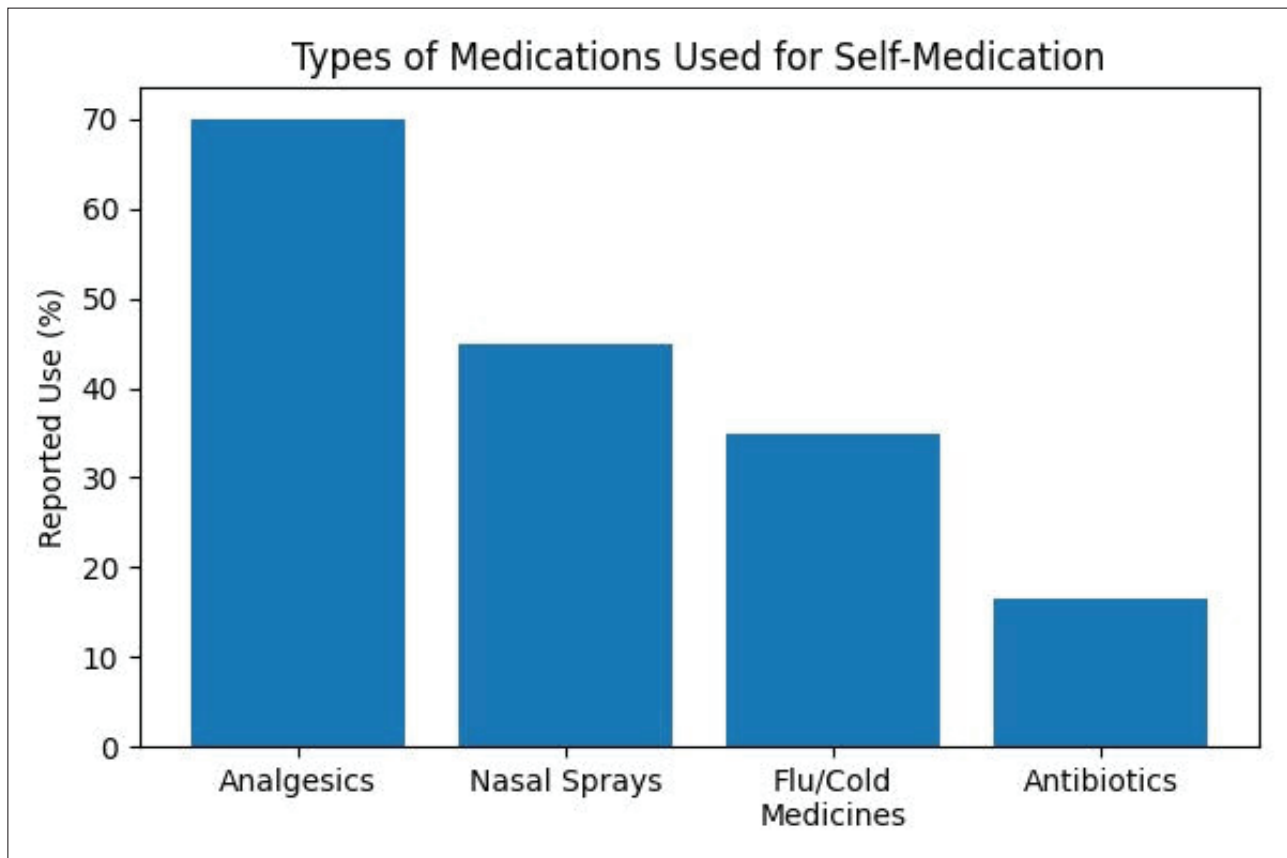


Figure 2. Types of medications used for SM among ENT patients in Bisha.

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Table 2. SM practices with conventional medicines.

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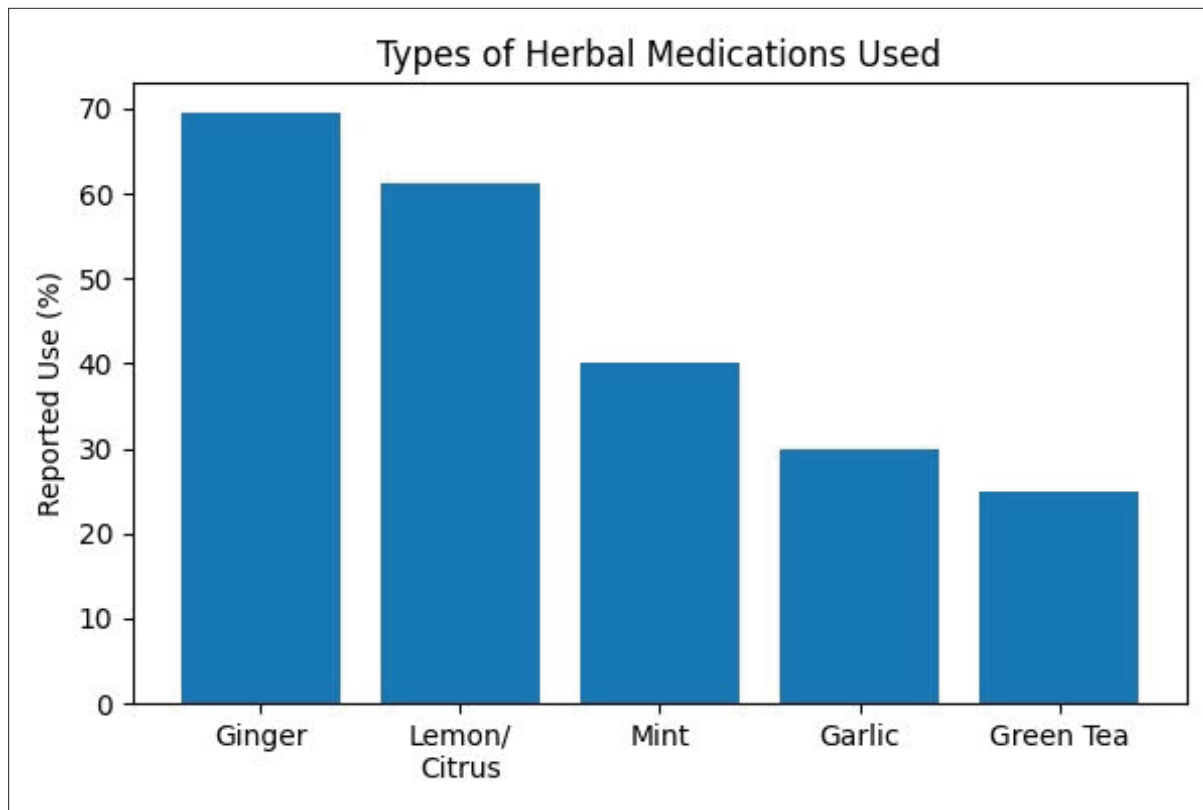
Question	Category	n (%)
Source of information about medicine used for ENT treatment	Doctor	194 (46.0)
	Pharmacist	121 (28.7)
	Internet	104 (24.6)
	Pharmaceutical sources	80 (19.0)
	Neighbor/relative/friend	80 (19.0)
	Other	53 (12.6)
	Medicine leaflet	28 (6.6)
Disposal of leftover medications	Kept at 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



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

Table 3. SM practices with herbal medicines.

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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.

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

322 Discussion

323 This study provides a comprehensive assessment of SM
 324 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.

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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.

333

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,

400	and reliance on unverified sources may contribute to	461	interventions aimed at improving medication safety
401	inappropriate SM practices.	462	and health literacy in the Bisha community and similar
402	The findings of this study have several important clinical	463	settings would be highly beneficial. Finally, multicenter
403	and public health implications. The high prevalence	464	studies across different regions of Saudi Arabia would
404	of antibiotic use without prescription underscores the	465	enhance the generalizability of findings and allow for
405	need for stricter enforcement of regulations governing	466	regional comparisons that could inform targeted, context-
406	the sale of antibiotics without a valid prescription, as	467	specific interventions.
407	well as public education campaigns about the risks of		
408	inappropriate antibiotic use and antimicrobial resistance.		
409	The widespread use of herbal remedies with limited	Conclusion	468
410	awareness of potential risks highlights the need for	This study found a high prevalence of SM practices	469
411	community-based educational programs that specifically	with both conventional and herbal medicines among	470
412	address the safety concerns associated with herbal	ENT patients in Bisha, Saudi Arabia. Analgesics and	471
413	medicine, including herb-drug interactions and the	antibiotics were the most commonly used conventional	472
414	importance of disclosing herbal remedy use to healthcare	medications, while ginger and lemon were the	473
415	providers. The role of pharmacists as accessible	predominant herbal remedies. Despite the widespread	474
416	healthcare professionals should be strengthened, as	use of herbal medicines, awareness regarding their	475
417	they are well-positioned to guide both conventional	potential risks and interactions with conventional	476
418	and herbal medications. In addition, the finding that	drugs was alarmingly low. The majority of respondents	477
419	the internet and social circles are the primary sources	relied on the internet and social circles for medication	478
420	of medication information suggests that digital health	guidance rather than healthcare professionals, which	479
421	literacy interventions and the development of reliable,	raises significant concerns about the quality and safety of	480
422	culturally appropriate online health resources could be	information driving SM behavior. No sociodemographic	481
423	effective strategies for improving medication safety in	variable was significantly associated with SM practices,	482
424	this population. Public health authorities should consider	indicating that this is a community-wide phenomenon.	483
425	developing targeted educational campaigns that address	These findings underscore the urgent need for broad-	484
426	the entire community, given the absence of significant	based, community-wide public health interventions that	485
427	demographic differences in SM practices.	focus on improving health literacy, promoting responsible	486
428	This study has several strengths, including a reasonable	medication use, strengthening the role of pharmacists in	487
429	sample size that meets the calculated requirement, the	patient education, and developing reliable and culturally	488
430	inclusion of both conventional and herbal SM practices,	appropriate health information resources for the public.	489
431	and the focus on a previously understudied population		
432	in the Bisha region. However, several limitations	List of Abbreviations	490
433	should be acknowledged. The cross-sectional design	AOR Adjusted odds ratio	491
434	only allows the identification of associations between	CI Confidence interval	492
435	variables and does not establish causality. The use of	ENT Ear, nose, and throat	493
436	an online, self-administered questionnaire does not	SM Self-medication	494
437	provide an opportunity to verify responses, potentially	SPSS Statistical Package for the Social Sciences	495
438	introducing response and recall bias. The convenience	WHO World Health Organization	496
439	sampling technique limits the generalizability of the		
440	findings to the broader Saudi population. In addition, the	Conflict of interest	497
441	near-homogeneity of the sample in terms of nationality	The authors declare that there is no conflict of interest	498
442	(99.5% Saudi) precluded meaningful analysis of the	regarding the publication of this article.	499
443	influence of nationality on SM practices and necessitated		
444	the exclusion of this variable from the logistic regression	Funding	500
445	model. Finally, social desirability bias may have	This research received no external funding.	501
446	influenced responses, particularly regarding practices		
447	that participants might perceive as inappropriate.	Consent to participate	502
448	Future research should employ longitudinal designs to	Written informed consent was obtained from all participants.	503
449	examine temporal trends in SM practices and their health		
450	outcomes. Qualitative studies are needed to explore the	Consent for publication	504
451	cultural and contextual factors driving SM behavior in	Not applicable, as no individual data requiring consent for	505
452	greater depth, particularly the decision-making processes	publication were included.	506
453	that lead individuals to choose herbal over conventional		
454	remedies or to combine both without professional	Ethical approval	507
455	guidance. Studies involving clinical assessments of the	Ethical approval was obtained from the Institutional Review	508
456	actual health consequences of SM, including adverse	Board/Ethics Committee of King Abdullah Hospital, Bisha,	509
457	drug reactions, herb-drug interactions, and treatment	Saudi Arabia (E-CTS Ref No. BIS-24-00022-22102024).	510
458	delays, would provide valuable evidence to inform		
459	clinical practice and public health policy. Furthermore,	Author details	511
460	research examining the effectiveness of educational	Rudaina Hussain Alelyani ¹ , Naif Abdulaziz M. Alqarni ¹ ,	512
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