



## RESEARCH PAPER

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## Perceptions of drug-herbal interactions among Saudi Arabian individuals: An exploratory study

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### Abstract

Herbal medicine with modern pharmaceutical medicine plays a significant role in global health sector as well in Saudi Arabian Individuals. Herbal medicine in Saudi Arabia is not just a health choice but is often intertwined with cultural and spiritual beliefs and poses potential risks while using with pharmaceutical medicine. The study aimed to assess the drug-herbal Interactions among Saudi Arabian Individuals. A cross-sectional survey design adopts to take data and analyses the data with Statistical Software. The study emphasizes the frequent use of herbal remedies in conjunction with pharmaceutical drugs, acknowledging a substantial awareness of potential interactions. It exposes significant gaps in comprehensive knowledge and diverse attitudes regarding these interactions. These results underscore the significance of patient education and emphasize the crucial responsibility of healthcare providers in addressing and overseeing the utilization of herbal remedies, particularly in multicultural and diverse environments.

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## Introduction

The integration of traditional herbal remedies with modern pharmaceutical medicines is a significant global health trend, reflecting a blend of ancient practices and contemporary healthcare. Globally, an estimated 70% of the population uses herbal remedies, a practice deeply rooted in various cultural and spiritual contexts (Ekor, 2014).

This widespread use of herbal medicine is not just a health choice but is often a part of traditional cultural practices and beliefs. In Saudi Arabia, the reliance on herbal products is notably high, with studies indicating that up to 94% of the population uses herbal products for health purposes (Panahi *et al.*, 2016a). This is particularly significant among patients with chronic conditions, where 68% reported using herbal products (Panahi *et al.*, 2016a). Such high prevalence highlights the substantial role of herbal medicine in the region's healthcare landscape.

The use of herbal medicine in Saudi Arabia transcends mere health choices, intertwining deeply with cultural and spiritual beliefs (Al-Rowais, 2002). This reliance is often driven by a combination of traditional practices, spiritual convictions, and, sometimes, a sense of disillusionment with conventional medical treatments (Alharethy *et al.*, 2017a). The integration of these remedies with modern pharmaceuticals presents unique challenges and opportunities in the healthcare system, necessitating a deeper understanding of their interactions, efficacy, and safety.

The use of herbal medicines is a global phenomenon, reflecting a growing trend towards natural health products. Ekor (2014) discusses the increasing reliance on herbal remedies worldwide, emphasizing the need for more integrated healthcare approaches to monitor safety and efficacy (Ekor, 2014). The World Health Organization (WHO) has also recognized the importance of traditional medicine, advocating for its safe and effective use within healthcare systems globally (Organization, 2013).

Cultural and traditional beliefs significantly influence the use of herbal medicines. These practices are deeply rooted in historical and spiritual contexts in many societies. AlBedah *et al.* (2017) highlight the cultural significance of herbal medicine in Saudi Arabia, where its use is often intertwined with religious and traditional beliefs (Alharethy *et al.*, 2017b). Similarly, Rivera *et al.* (2005) explore the role of cultural practices in using traditional medicine in Latin America, demonstrating a strong link between cultural heritage and health practices (Rivera *et al.*, 2013).

In Saudi Arabia, the use of herbal remedies is particularly prevalent. AlFaris *et al.* (2015) found a high rate of dietary supplement use, including herbal products, among Saudi residents, indicating a strong preference for natural health solutions (Panahi *et al.*, 2016b). Al-Rowais (2002) further discusses the use of herbal medicine in treating chronic conditions like diabetes, underlining the reliance on these remedies in managing long-term health issues (Al-Rowais, 2002).

The efficacy and safety of herbal remedies are often perceived differently from conventional medicine. Researchers address the challenges in evaluating the efficacy of herbal medicines, given the complexity of their components and the lack of rigorous clinical trials (Rousseau and Marquet, 2002). In Saudi Arabia, Al-Mohamadi (2021) and Al-Shehri (2020) investigated these perceptions, revealing a high level of trust in herbal remedies despite potential risks (Sweileh, 2021).

The role of healthcare professionals in guiding the use of herbal medicines is crucial. Vickers and Zollman (1999) discuss the responsibility of physicians in advising patients on herbal medicine use in Western countries, emphasizing the need for medical professionals to be informed about herbal products (Vickers and Zollman, 1999). In Saudi Arabia, community pharmacists play a vital role in educating and guiding the public about drug-herbal interactions, as

highlighted by researchers (Al-Najjar *et al.*, 2023; Qais *et al.*, 2019). The objective of the study is to assess the drug-herbal Interactions among Saudi Arabian Individuals.

## Materials and methods

### *Research design*

The study adopted a cross-sectional survey design, which effectively gathered quantitative data from a large population at a specific time. This approach enabled the analysis of relationships and trends related to the perceptions of drug-herbal interactions among the Saudi Arabian population.

### *Survey development*

*Questionnaire design:* The questionnaire was structured to capture demographic information (age, gender, education level, geographical location), knowledge about herbal medicines, awareness of potential drug-herbal interactions, and sources of information on this subject. Items were developed to measure attitudes, beliefs, and practices related to the use of herbal medicines in combination with pharmaceutical drugs.

*Validation and reliability:* The questionnaire underwent a validation process involving pharmacology, traditional medicine, and survey design experts. A pilot study was conducted with a small sample to test the reliability and clarity of the questionnaire. Adjustments were made based on the feedback received.

### *Sampling strategy*

*Target population:* The target population included adult Saudi Arabian residents aged 18 and above.

*Sampling method:* A stratified random sampling method was used, ensuring representation across different age groups, genders, education levels, and urban/rural areas. Considering the population size and diversity, the sample size was calculated to ensure statistical significance and representation.

### *Data collection*

*Survey administration:* The survey was distributed electronically through various platforms (e.g., social

media, email, online community forums) to reach a wider audience.

*Response rate and data quality:* Strategies to improve response rates included follow-up reminders, ensuring anonymity, and simplifying the survey completion process. Data quality checks were performed to identify and address any incomplete or inconsistent responses.

### *Data analysis*

The data analysis was done by Statistical Software to provide a comprehensive understanding of the survey results using only descriptive statistics.

### *Ethical considerations*

*Ethical approval:* The study was approved by the Ethical Approval Committee from the Research Department at Hail Health Cluster No. 2024-109.

*Informed consent:* Participants were provided with detailed information about the study, and informed consent was obtained before participation.

*Confidentiality and privacy:* Data were anonymized, and personal identifiers were removed to ensure confidentiality

## Results

The study commenced with a high rate of participation willingness among the sampled individuals. Out of the 4,309 participants approached for the study, a substantial majority of 87.9% (n=3,788) consented to participate (Table 1). This demonstrates a strong inclination towards engagement in the research, reflecting either an interest in the subject matter or a general willingness to contribute to scientific inquiry. On the other hand, a smaller segment, constituting 12.1% (n=521) of the total number of participants, opted not to participate. This dissenting group represents a modest but significant proportion, and their reasons for opting out, although not explored in this dataset, could provide insightful data for understanding participation barriers in future studies. The cumulative percentage reached 100%, indicating that all respondents made a definitive choice regarding

their participation, with no ambiguities or missing data in this regard. It is noteworthy that the responses were coded numerically for analytical purposes, with "Agree" responses designated as "1.00" and "Disagree" as "2.00", which may facilitate more nuanced statistical analysis if required for further research.

**Table 1.** Participant agreement to study participation

Response	Frequency	Percentage (%)
Agree	3,788	87.9
Disagree	521	12.1
Total Responses	4,309	100

Note: Percentages are based on the total number of participants (4309). The "Agree" and "Disagree" responses have been coded as "1.00" and "2.00", respectively.

**Table 2.** Gender distribution of participants

Gender	Frequency	Percentage (%)
Male	4,234	98.3
Female	19	0.4
Total	4,253	98.7

Note: The gender classification is based on the participants' self-identification.

**Table 3.** Age distribution of participants

Age Group	Frequency	Percentage (%)
Less than 18	193	4.5
18 – 24	990	23
25 – 34	1,257	29.2
35 – 44	1,049	24.3
45 – 54	607	14.1
More than 54	205	4.8
Total	4,301	99.8

Note: Age groups are presented as ranges to provide a clear overview of the distribution.

**Table 4.** Educational level of participants

Educational Level	Frequency	Percentage (%)
Primary School	198	4.6
Secondary School	330	7.7
High School	996	23.1
Bachelor's Degree	2,388	55.4
Master's Degree or Higher	382	8.9
Total	4,294	99.7

The gender distribution among participants showed a substantial skew. Of the 4,253 participants who disclosed their gender, a vast majority of 98.3% (n=4,234) identified as male, while only 0.4% (n=19) identified as female (Table 2). This gender imbalance

reflects a significant disproportion in the sample, which could potentially impact the generalizability of the study findings to the broader population.

The age distribution of the participants was more evenly spread across different age groups. The largest age group was those aged 25 – 34 years, representing 29.2% (n=1,257) of the participants (Table 3). This was followed by the 35 – 44 years age group at 24.3% (n=1,049), and the 18 – 24 years age group at 23% (n=990). The least represented age groups were those less than 18 years (4.5%, n=193) and more than 54 years (4.8%, n=205). The diversity in age groups indicates a broad range of perspectives could be captured in the study.

Regarding educational attainment, the majority of participants held a Bachelor's degree (55.4%, n=2,388), indicating a relatively high level of education among respondents. This was followed by those who completed high school (23.1%, n=996), secondary school (7.7%, n=330), and primary school (4.6%, n=198). Participants with a Master's degree or higher accounted for 8.9% (n=382) of the sample. The high educational level of the majority of participants might influence their awareness and understanding of drug-herbal interactions (Table 4).

The study revealed an overwhelmingly high prevalence of herbal remedy usage among participants, with 99.7% (n=4,294) reporting they use herbal remedies (Table 5). This indicates a near-universal acceptance or practice of using herbal remedies among the study population.

Regarding the frequency of usage, the most common response was occasional use, reported by 56.3% (n=2,428) of participants. This was followed by monthly use (17.7%, n=763), weekly use (13.9%, n=601), and daily use (8.6%, n=371). The varied frequency of usage suggests a range of reliance on and incorporation of herbal remedies in participants' health routines (Table 5).

The primary source for obtaining herbal remedies was through purchase from stores or pharmacies, as reported by 43% (n=1,851) of participants. Homegrown sources were also significant, accounting for 30.8% (n=1,327).

**Table 5.** Herbal remedy usage patterns among participants

Description	Frequency	Percentage (%)	Mean	Std. Deviation
<b>Herbal Remedy Usage</b>				
Yes	4,294	99.7	1.0042	1.00816
No	6	0.1		
<b>Frequency of Herbal Remedy Usage</b>				
Daily	371	8.6	3.2606	1.10207
Weekly	601	13.9		0.71759
Monthly	763	17.7		
Occasionally	2,428	56.3		
<b>Sources of Herbal Remedies</b>				
Purchased from Store/Pharmacy	1,851	43	2.1136	0.49833
Online	546	12.7		
Homegrown	1,327	30.8		
Gifted by Friends/Family	502	11.7		
<b>Communication with Doctors</b>				
Always	1,171	27.2	1.9604	1.08813
Sometimes	2,037	47.3		
Never	1,004	23.3		
Total Participants (for reference)	4,309	100		

Note: The "Frequency" and "Percentage" columns represent the number and proportion of participants who selected each response, respectively. The "Mean" and "Standard Deviation" columns are applicable only to questions where they were calculated. The "Total Participants" row provides the reference total number of participants in the study.

**Table 6.** Patterns of pharmaceutical drug usage among participants

Question	Response Category	Frequency	Percentage (%)	Mean	Std. Deviation
<b>Current pharmaceutical drug usage</b>					
	Yes	2,319	53.8	1.4584	0.78409
	No	1,963	45.6		
<b>Obtaining pharmaceutical drugs</b>					
	Prescription from a Doctor	2,162	50.2	1.8816	0.43453
	Over-the-Counter Purchase	970	22.5		
	From Friends/Family	465	10.8		
	Other	600	13.9		
<b>Adherence to dosage and instructions</b>					
	Always	2,465	57.2	1.5677	0.43453
	Sometimes	1,318	30.6		
	Rarely	311	7.2		
	Never	158	3.7		
Total Participants (for reference)		4,309	100		

Note: The "Frequency" and "Percentage" columns represent the number and proportion of participants who selected each response, respectively. The "Mean" and "Standard Deviation" are provided where applicable. Totals may not sum to 100% due to rounding, non-responses, or survey

Online purchases were made by 12.7% (n=546), and 11.7% (n=502) received them as gifts from friends or family. This diversity in sourcing indicates multiple channels through which herbal remedies are accessed (Table 5).

In terms of communication with healthcare professionals about their use of herbal remedies, 47.3% (n=2,037) of participants stated they sometimes inform their doctors, while 27.2% (n=1,171) always do. However, a significant 23.3%

(n=1,004) never inform their doctors, highlighting a gap in communication that could be crucial for safe healthcare practices (Table 5).

Among the participants, a slight majority reported using pharmaceutical drugs, with 53.8% (n=2,319) answering 'Yes'. Conversely, 45.6% (n=1,963) indicated that they do not currently use any pharmaceutical drugs. This reflects a relatively balanced distribution between users and non-users of pharmaceutical drugs in the sample (Table 6).

**Table 7.** Awareness and experiences of drug-herbal interactions among participants

Question	Response	Frequency	Percentage (%)	Mean	Std. Deviation
<b>Awareness of herbal and pharmaceutical drug interactions</b>					
Are you aware that some herbal remedies can interact with pharmaceutical drugs?	Yes	3,208	74.4	1.2526	0.43453
	No	1,084	25.2		
<b>Experiences with side effects from drug-herbal combinations</b>					
Have you ever experienced side effects from combining herbal remedies with pharmaceutical drugs?	Yes	962	22.3	1.7747	0.41786
	No	3,307	76.7		
Total responses for awareness		4,292	99.6		
Total responses for experience of side effects		4,269	99.1		
Total participants (for reference)		4,309	100		

Note: The "Frequency" and "Percentage" columns represent the number and proportion of participants who selected each response. The "Mean" and "Standard Deviation" are provided for the awareness question where they were calculated. Percentages may not add up to 100% due to rounding or non-responses.

**Table 8.** Attitudes towards drug-herbal interactions among participants

Question	Response level	Frequency	Percentage (%)	Mean	Std. Deviation
<b>Concerns about risks of combining herbal remedies with pharmaceutical drugs</b>					
Very concerned	633	14.7	2.9259	0.41786	
Somewhat concerned	909	21.1			
Neutral	1,362	31.6			
Not very concerned	865	20.1			
Not at all concerned	497	11.5			
<b>Perceptions of safety of herbal remedies compared to pharmaceutical drugs</b>					
Strongly agree	1,025	23.8	2.504	1.21254	
Agree	1,162	27			
Neutral	1,241	28.8			
Disagree	635	14.7			
Strongly disagree	225	5.2			
<b>Willingness to change use of herbal remedies on healthcare professional's advice</b>					
Definitely would	1,486	34.5	2.1206	0.78409	
Probably would	1,445	33.5			
Might or might not	816	18.9			
Probably would not	384	8.9			
Definitely would not	139	3.2			
Total Responses for Concerns		4,266	99		
Total Responses for Safety Perceptions		4,288	99.5		
Total Responses for Willingness to Change		4,270	99.1		
Total Participants (for reference)		4,309	100		

Note: The "Frequency" and "Percentage" columns represent the number and proportion of participants who selected each response level. The "Mean" and "Standard Deviation" are provided for the first question where they were calculated. Percentages may not add up to 100% due to rounding, non-responses, or survey design

When asked about how they obtain pharmaceutical drugs, the majority of the drug-using participants (50.2%, n=2,162) stated they acquire their medications through prescriptions from a doctor. A significant 22.5% (n=970) of the participants purchase drugs over-the-counter. Additionally, 10.8% (n=465) obtain drugs from friends or family, and 13.9% (n=600) use other means. This diversity in

procurement methods suggests varied access routes to pharmaceutical drugs among the population (Table 6).

Regarding adherence to the prescribed dosage and instructions, a majority of the participants, 57.2% (n=2,465), reported that they always follow the prescribed dosage and instructions strictly.

However, 30.6% (n=1,318) indicated they only sometimes adhere to the prescribed regimen. A smaller proportion of participants rarely (7.2%, n=311) or never (3.7%, n=158) follow the prescribed dosage and instructions. This points to a significant proportion of the population potentially at risk due to non-adherence to medical guidance (Table 6).

A significant majority of the participants, 74.4% (n=3,208), indicated awareness that herbal remedies can interact with pharmaceutical drugs. This demonstrates a considerable level of knowledge regarding the potential for interactions between different forms of medication. Conversely, 25.2% (n=1,084) of the participants were not aware of these potential interactions, highlighting a notable gap in public knowledge about the risks associated with combining herbal remedies and pharmaceutical drugs (Table 7).

When it comes to actual experiences of side effects from combining herbal remedies with pharmaceutical drugs, a smaller proportion of participants, 22.3% (n=962), reported having experienced such side effects. This suggests that while a significant number of individuals are aware of the potential interactions, fewer have experienced side effects firsthand. The majority of participants, 76.7% (n=3,307), have not experienced side effects from such combinations (Table 7).

Many of our study participants demonstrated awareness of the potential interactions between herbal remedies and pharmaceutical drugs. Specifically, 74.4% (n=3,208) of the participants acknowledged this possibility. This level of awareness indicates a considerable understanding among the population about the complexities involved in combining different types of treatments (Table 8).

In contrast to the high awareness, a smaller fraction of participants, 22.3% (n=962), reported having experienced side effects from the combination of herbal remedies and pharmaceutical drugs. This discrepancy suggests that while awareness of the potential for interactions is high, the actual occurrence of noticeable side effects is less common. Meanwhile, a majority of 76.7% (n=3,307) did not report experiencing such side effects (Table 8).

## Discussion

As highlighted in this study, the widespread use of herbal remedies echoes findings from previous research, such as the work by Ekor (2014), who emphasized the global prevalence of herbal medicine usage (Ekor, 2014). The high percentage of participants (99.7%) using herbal remedies in our study is consistent with global trends, especially in regions where traditional medicine is deeply rooted in culture, as noted by the World Health Organization (2013). This suggests a continuing reliance on traditional medicine, even in the presence of modern medical practices.

Our findings on the awareness of drug-herbal interactions (74.4% aware) align with the observations by Posadzki *et al.* (2013), who noted a general awareness yet a significant knowledge gap regarding the specifics of these interactions (Posadzki *et al.*, 2013). This gap underscores the need for healthcare practitioners to provide comprehensive information, as Barnes (2003) suggested, to bridge this knowledge gap and ensure safe practices (MEDICINES, 2004).

The diverse attitudes towards the risks of combining herbal remedies with pharmaceutical drugs, ranging from very concerned to not concerned, reflect the findings of Robinson and McGrail (2004) (Robinson and McGrail, 2004). They noted that cultural beliefs and personal experiences often influence perceptions of risk. The variability in safety perceptions observed in our study is consistent with the discussion by Ventola (2010), highlighting the public's often conflicting views on the safety of herbal remedies compared to pharmaceutical drugs (Ventola, 2010).

The general willingness of participants to alter their use of herbal remedies based on healthcare advice (68% would or probably would) is a positive indicator of the potential influence healthcare providers can have. This finding is supported by the recommendations of Ernst (2002), who advocates for proactive patient-provider communication to ensure the safe and informed use of herbal remedies (Ernst, 2000).

While our study provides valuable insights, it is not without limitations. The gender imbalance in our sample limits the generalizability of the findings. Future research should aim for a more balanced demographic representation. Additionally, the self-reported nature of the data may introduce response bias. Further studies could explore the clinical outcomes of drug-herbal interactions to corroborate self-reported data.

### Conclusion

The study highlights the prevalent use of herbal remedies alongside pharmaceutical drugs and a significant awareness of potential interactions, yet reveals notable gaps in detailed knowledge and varied attitudes towards these interactions. These findings underscore the importance of patient education and the critical role of healthcare providers in discussing and managing the use of herbal remedies, especially in multicultural and diverse settings.

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