

Drug Interaction Knowledge, Attitudes, and Practices: A Social Media-Based Survey of the Syrian Population



Ola Habib, Ayat Abboud

Abstract: Prescribing multiple medications increases the risk of drug interactions, which can be classified or ranked using various terms and methods. Drugs can interact with other drugs, foods, beverages, and herbs, both inside and outside the body. Understanding public awareness of medication use is crucial for maintaining health. This study assessed the knowledge and personal experiences of drug interactions among 140 Syrians via a social media survey. The participant demographic was predominantly female (55.1%), aged 20-30 (58.3%), held a bachelor's degree (57%), and worked in the healthcare field (77.1%). All respondents (100%) were aware of drug interactions, with Drug-Drug interactions being the most recognized type (88.1%). The majority of respondents (70.3%) read medication leaflets and perceived the risk of interactions as moderate (53.4%). Notably, 54.2% of participants reported having personally experienced a serious drug interaction, with nausea/vomiting (46.8%) being the most common symptom. Upon suspicion of an interaction, most consulted a doctor (55.9%) or a pharmacist (37.3%). While 58.6% felt sufficiently informed about drug interactions, an apparent reliance on and preference for pharmacists was evident: they were a primary information source (57.3%) and the most preferred method for gaining awareness (55.9%). In conclusion, despite high theoretical awareness, a significant portion of this health-literate cohort experienced drug interactions, underscoring a critical gap between knowledge and real-world outcomes. The central role of pharmacists was highlighted as a key resource for public education and intervention.

Keywords: Drug Interactions, Knowledge, Survey, Syrians.

Nomenclature:

NNRTI: Non-Nucleoside Reverse Transcriptase Inhibitor

I. INTRODUCTION

Understanding drug interactions in vitro is essential to avoid compromising drug efficacy before administration [1]. While not every theoretical drug interaction manifests in practice [2], they remain a significant cause of adverse effects associated with drug administration [3]. Among herbs [4], St. John's wort can cause considerable drug interactions by

inducing the metabolism of several drugs [5]. In vivo interactions at the pharmacokinetic level affect drug absorption [6], distribution [7], biotransformation [8], and excretion [9]. The induction [10] or inhibition [11] of cytochrome P450 (CYP450) enzymes is fundamental to many drug interactions [12]. Induction of substrate metabolism can lead to treatment failure [13], while inhibition can cause serious interactions by exacerbating substrate toxicity [14]. Inhibition is a relatively rapid process compared to induction [15], and the number of drugs that inhibit metabolism is far greater than that of drugs that induce it [16]. The role of drug transporters [17], particularly the P-glycoprotein (P-gp) [18], in drug interactions is increasingly recognized [19]. P-gp affects absorption [20], distribution [21], and excretion [22], thus playing a key role in pharmacokinetic interactions [23] and interacting with CYP450 enzymes [24]. In pharmacodynamic interactions, drugs enhance or inhibit effects at the target level [25]. Beneficial drug interactions are clinically investigated to identify advantageous combinations [26]. Extensive research has led to the development of numerous in vitro [27] and in vivo methods [28] for detecting [29] and predicting drug interactions [30]. Adequate awareness [31] and knowledge of potential drug interactions [32] are crucial for their prevention and for mitigating their consequences [33].

A drug Interaction is a change in the nature or effect of a medication due to the concurrent administration of one or more other drugs [34], or of food [35] or beverages [36]. Drug-drug interactions are a known factor affecting drug response and a leading cause of adverse drug events [37].

Research has highlighted the epidemiological features of drug interactions [38], with reports indicating that approximately 21% of hospital admissions due to adverse drug reactions are attributable to them [39]. A meta-analysis of 39 studies in US hospitals (1966–1996) reported that approximately 7% of hospital admissions were due to drug interactions [40]. An analysis of prescription data from 2.1 million Italians (2004–2005) identified 27 potential drug-interacting pairs [41]. Another extensive Australian study found that 1.5% of people were prescribed potentially dangerous drug combinations [42], with such interactions observed at a rate greater than 5% [43].

Antiretroviral drugs cause significant drug-drug interactions [44]. Various studies in patients with HIV-associated conditions have shown a prevalence of

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*Correspondence Author(s)

Ola Habib, Student, Faculty of Pharmacy, University of Latakia, Latakia, Syria. Email ID: olahabib2025@gmail.com, ORCID ID: [0009-0003-3201-7923](https://orcid.org/0009-0003-3201-7923)

Ayat Abboud*, Professor, Department of Medicinal Chemistry and Quality Control, Faculty of Pharmacy, University of Tishreen, Latakia, Syria. Email ID: ayat.abboud@latakia-univ.edu.sy, ORCID ID: [0000-0001-8387-3875](https://orcid.org/0000-0001-8387-3875)

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clinically significant drug interactions ranging from 23% to 40% [45]. Associated risk factors include age over 42 years, more than three comorbidities [46], treatment with more than three antiretroviral agents [47], and HIV protease inhibitor (PI) therapy [48]. Clinically significant drug interactions were more common in PI-based regimens than in non-nucleoside reverse transcriptase inhibitor (NNRTI)-based regimens.

II. METHODS

A social media-based survey was conducted between April and May 2025 to assess awareness and its impact regarding drug interactions. The questionnaire included several questions about participants' demographic information and their knowledge of drug interactions.

III. RESULTS

A. Demographic Data of Participants

This study included 140 responses. Table I displays the demographic attributes of the participants.

Table I: Demographic Characteristics of Participants

Demographic Characteristics	
Sex	
Female	55.10%
Male	44.90%
Age	
20-30	58.30%
31-45	36.40%
46-60	10%
Otherwise	5%
Educational Level	
Bachelor's	57%
Master	19.50%
Doctorate	8%
University student	10.30%
Secondary	5%
Preparatory class	2%
Working in the Health Field	
Yes	77.10%
No	22.90%

Most participants were female (55.1%), aged 20-30 (58.3%), held a bachelor's degree (57%), and worked in the health field (77.1%).

B. Participant Knowledge About Drug Interactions

Table II and III show the survey results regarding participants' knowledge of and personal experiences with drug interactions.

All participants were aware of drug interactions (100%). The majority knew about drug-drug interactions (88.1%), a large percentage read the prescription leaflet (70.3%), and most believed drug interactions occur at a moderate rate (53.4%).

The majority of participants (54.2%) had experienced a serious drug interaction. The most common symptoms were nausea and vomiting (46.8%), followed by persistent headaches (33.8%). A high level of awareness was noted, as most recognized the potential for serious complications (74.4%) and the importance of consulting a professional.

When suspecting an interaction, most contacted a doctor (55.9%) or a pharmacist (37.3%). A large percentage had experienced side effects from multiple medications (75.9%), and the vast majority reported these effects to a provider (89.9%).

Table II: Participants' Knowledge of Drug Interactions

Have you Ever Heard of Drug Interactions?	
Yes	100%
No	0%
Which type of Interaction have you heard of?	
Drug - Drug	88.1%
Drug - Food	61.9%
Drug - Disease	2.5%
Drug - Supplements	0.8%
Do you read the Package Label that comes with the Medicine?	
Yes	70.3%
No	4.3%
Not always	25.4%
In your Opinion, how Common are Drug Interactions in Medical Practice?	
Very rare	11%
Medium	53.4%
Common	32.2%
Very common	3.4%

Table III: Results of Personal Experiences with Drug Interactions

Have you ever Experienced a Serious Drug Interaction?	
Yes	54.2%
No	45.8%
If yes, which of these Symptoms did you experience?	
Diarrhoea or constipation	23.4%
persistent headache	33.8%
Nausea or vomiting	46.8%
rapid heartbeat	31.2%
Skin rash	2.6%
Cough	1.3%
Cardiac arrest, skin allergy	4%
inflammation of the mucous membranes	1.3%
What did you do when a Drug Interaction was suspected?	
Contacting the doctor	55.9%
Contacting the pharmacist	37.3%
Changing medication	3.8%
Other (e.g. reviewing patient history)	3%
Can Drug Interactions Lead to Serious Complications?	
Yes	74.4%
No	25.6%
When Taking Multiple Medications, do you consult a Professional about Potential Interactions?	
Yes	91.4%
No	8.6%
Have you experienced Side effects from Multiple Medications?	
Yes	75.9%
No	24.1%
If yes, did you inform a doctor or Pharmacist?	
Yes	89.9%
No	10.1%

The majority of participants felt they had sufficient knowledge about drug interactions (58.6%). The most common information sources were pharmacists and drug leaflets (both 57.3%). The preferred method for gaining awareness was speaking with a community pharmacist (55.9%).

Table IV: Results of Subscriber Information About Drug Interactions

Do you feel you have Enough Information about Drug Interactions?	
Yes	58.6%
No	41.4%
What is your Source of Information regarding Drug Interactions?	
Doctor	30.8%
Pharmacist	57.3%
Drug leaflet	57.3%
Google	23.1%
Other (My university lectures, etc.)	3.6%
What is your Preferred method for Gaining Awareness about Drug Interactions?	
Drug leaflet	47.5%
Social media	25.4%
Speak to a pharmacist in your area	55.9%
Google	18.6%
Doctor	0.8%
BNF Updates	0.8%

IV. DISCUSSION

This study provides a timely investigation into the awareness and personal experiences of drug interactions within a Syrian population, a subject of critical importance for public health and medication safety. The findings paint a picture of a predominantly young, educated, and health-literate cohort with a surprisingly high level of theoretical knowledge about drug interactions. The universal awareness (100%) of drug interactions among participants is notably higher than what is often reported in general population studies [48]. This, coupled with the high recognition of drug-drug interactions (88.1%), is likely a direct reflection of the sample's demographic skew, where 77.1% worked in the healthcare field [49]. This group's inherent exposure to medical information creates a best-case scenario for public knowledge, suggesting that educational background is a strong predictor of awareness. Furthermore, the proactive behaviour of reading medication leaflets (70.3%) and the predominant belief that interactions are a moderate risk (53.4%) indicate a population that is generally engaged and cautious in its medication use. However, the most striking finding of this survey is the stark contrast between this high awareness and the reported lived experiences. Despite their knowledge, over half of the participants (54.2%) reported having experienced a serious drug interaction. This discrepancy highlights a significant "knowledge-practice gap." It suggests that awareness alone is an insufficient shield against the complexities of individual patient factors and the vast number of potential interacting substances. The most common symptoms—nausea/vomiting (46.8%) and persistent headache (33.8%)—are non-specific but debilitating, underscoring how interactions can manifest as vague ailments that may be overlooked or misattributed by both patients and providers, potentially leading to prolonged discomfort or more severe outcomes. The participants demonstrated commendable health-seeking behavior when confronted with a suspected interaction. The overwhelming tendency to contact a doctor (55.9%) or pharmacist (37.3%) reflects a firm trust in and reliance on healthcare professionals. This is further corroborated by the fact that 91.4% consult a provider when taking multiple medications and 89.9% report side effects. This establishes a solid

foundation for effective intervention, where healthcare providers are already seen as the primary resource.

In terms of information sources and preferences, the pharmacist's central role is unmistakable. Pharmacists were tied with medication leaflets as the most common source of information (57.3%) and were the overwhelmingly preferred method for gaining awareness (55.9%). This positions the community pharmacist as a pivotal and accessible figure in the healthcare landscape, ideally positioned to provide patient education, screen for drug interactions, and intervene proactively. The fact that over 40% of participants still felt they lacked sufficient information, despite their high baseline knowledge, points to an apparent demand for more structured and accessible educational resources.

This study has limitations. The use of a social media survey and a snowball sampling method likely introduced selection bias, over-representing younger, tech-savvy, and health-literate individuals. The high proportion of healthcare workers further limits the generalizability of the findings to the broader Syrian population, which may have significantly lower levels of awareness. The cross-sectional design also prevents the establishment of causal relationships. Nonetheless, the study's strength lies in its unique focus on the Syrian context and its ability to clearly identify the critical gap between knowledge and real-world experience, even within a highly informed group.

V. CONCLUSION

The results lead to several key recommendations. First, there is a pressing need to translate high-level awareness into practical, actionable knowledge. Public health campaigns should move beyond simply stating that interactions exist and focus on educating the public on common interaction pairs, recognising early symptoms, and emphasising the imperative to disclose all medications (including over-the-counter drugs, herbs, and supplements) to their pharmacist or doctor. Second, the findings strongly advocate for empowering and enhancing the training of community pharmacists in drug interaction screening and patient counselling, leveraging existing public trust. Finally, implementing mandatory software-based interaction checks within pharmacy and clinical practice in Syria could serve as a systematic safety net, catching potential errors that even knowledgeable individuals might miss. In conclusion, while the surveyed Syrian cohort demonstrates a strong foundational knowledge of drug interactions, the high prevalence of personal experiences with adverse events reveals a critical gap. Closing this gap requires a concerted shift from raising awareness to implementing practical strategies that empower Both healthcare providers and patients need to navigate the complexities of safely using multiple medications.

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As the article's author, I must verify the accuracy of the following information after aggregating input from all authors.

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Based on my understanding, this



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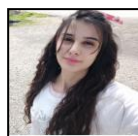
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AUTHOR'S PROFILE



Ola Habib, Undergraduate Student, Fifth year in Pharmaceutical Chemistry and Quality Control Department at the Faculty of Pharmacy, Latakia University, Latakia, Syria. Pharmacy student at Latakia University, with registration dates in 2019 and 2024. ICDL certificate in 2024.

Highlights:

Board theoretical experience in analytical methods, synthesis of organic compounds, pharmaceutical preparations, medicinal chemistry principles, TLC methods, high liquid performance methods, GC methods, UV/visible spectrophotometer principles, electrochemical techniques, IR and NMR specters, extraction methods, gel electrophoresis methods, capillary electrophoresis methods, quality control of solid dosage forms, quality control of liquid dosage forms, quality control of semi-solid dosage forms, GMP, GLP, sampling, Food chemistry.



Ayat Abbood, Professor in pharmaceutical chemistry and quality control department, Latakia University PhD in pharmacy in the field of drug control (2006- 2010, University of Paris-11, France) Master 2 Research: Research and Analytical Development (2005-2006, University of Paris-11, France) Professional Master 1: Quality Control of Medicines and Other Health Products (2004-2005, University of Paris-11, France) Bachelor's degree in Pharmacy and Medicinal Chemistry (1996-2000, Latakia University, Latakia) Head of Medicinal Chemistry and Quality Control -Faculty of Pharmacy Latakia University (2021 until 2025) - Head of Pharmacy Department College of Pharmacy and Health Sciences Al-Manara University (3 years) Dean of Pharmacy Faculty -Al-Jazeera University (one year).

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