Libyan Journal of Medical Research

www.ljmr.ly/

eISSN:2413-6096

Original Article

Survey on Drug–Drug Interactions and Medicine Use in Hospitalized Patients

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Received:18/08/2025 Accepted:02/09/2025Published:18/09/2025 DOI: https://doi.org/10.54361/LJMR.19.2.32

ABSTRACT:

Background: Drug-drug interactions (DDIs) are a significant concern in hospitalized patients, as they can compromise treatment effectiveness and patient safety. Limited data exist regarding the prevalence, patterns, and awareness of DDIs in Libyan healthcare settings, where both hospital and private clinic patients often receive multiple medications, including prescription, over-the-counter, and herbal remedies. Understanding these patterns is essential for optimizing pharmacotherapy and preventing adverse outcomes. **Aim of the study:** This study aimed to investigate the prevalence of DDIs and patterns of medicine use among hospitalized patients in Libyan hospitals and private clinics, while also assessing patient awareness and attitudes toward DDIs. **Material and Methods:** A cross-sectional study was conducted from March to May 2025. Adult patients (≥18 years) admitted for at least 24 hours and prescribed two or more medications were included. Data were collected from medical records and prescribing charts and entered into SPSS version 26.0. Potential DDIs were identified using validated screening tools. Descriptive statistics, including frequencies and percentages, were applied to analyze demographic characteristics, medication use patterns, and awareness levels. **Results:** The study revealed a heterogeneous patient demographic, with widespread use of prescription, over-the-counter, and herbal medications. Awareness of DDIs was moderate (50%), yet 55% of patients believed that combining medicines could be harmful. Reported adverse effects due to drug combinations were noted by 52% of participants. Medication disclosure to healthcare providers was inconsistent, with only 36% always informing, 35% sometimes, and 29% never disclosing their use of additional medicines. Importantly, 57% of patients expressed a desire for more information about DDIs. **Conclusion**: This study offers foundational insights into the prevalence and awareness of DDI among hospitalized patients in Libya. The results emphasize the urgent need for enhanced medication safety strategies, including patient education, routine DDI screening, and strengthened patient-provider communication. Future research should focus on identifying specific DDI types, evaluating their clinical impact, and testing the effectiveness of preventive interventions to optimize pharmacotherapy and improve patient outcomes.

Keywords: Drug-Drug Interactions, Hospitalized Patients, Medication Use, Patient Awareness, Libya

How to cite this article: Beshna, E.A and ALshareef. F. A., Survey on Drug–Drug Interactions and Medicine Use in Hospitalized Patients

Libyan 19-2

INTRODUCTION:

Drug-drug interactions (DDIs) represent a significant concern in clinical practice, particularly within the complex environment of hospitalized patients [1]. The concurrent administration of multiple medications, a common occurrence in modern healthcare, increases the likelihood of DDIs, which can lead to altered drug efficacy, adverse drug reactions (ADRs), and increased morbidity and mortality [2, 3]. These interactions can range from minor, clinically insignificant events to severe, life-threatening complications, posing a substantial challenge to patient safety and healthcare outcomes [1]. Even with preventive measures, DDIs can still occur. Continuous monitoring of patients for adverse effects and therapeutic responses is essential. Regular reassessment of medication regimens, especially for patients on multiple drugs or those with changing health conditions, allows for timely adjustments to prevent or manage interactions. Clinicians should also consider drug-disease and drug-food interactions unique to individual patients [4]. The prevalence of potential DDIs (pDDIs) among hospitalized patients is notably high, with various studies reporting a wide range of estimates depending on the patient population, healthcare setting, and the methods used for detection [5, 6]. For instance, some research indicates that a significant proportion of hospitalized patients experience at least one pDDI during their stay, although not all of these interactions are clinically relevant or result in actual harm [7]. The identification and management of these interactions are crucial for optimizing pharmacotherapy and preventing adverse events [8]. Furthermore, the patterns of medicine use in hospitalized patients are often intricate, involving polypharmacy, multiple prescribers, and frequent medication changes, which further contribute to the risk of DDIs [9]. Understanding these medication use patterns, along with factors such as patient demographics, comorbidities, and the types of medications prescribed, is essential for developing effective strategies to mitigate DDI risks [10].

This introduction aims to provide an overview of the current understanding of drug-drug interactions and medicine use in hospitalized patients, highlighting their prevalence, clinical significance, and the challenges associated with their management.

The aim of the study:

This study investigates drug-drug interactions (DDIs) and medication use among patients in Libyan hospitals and private clinics. Key findings indicate a high prevalence of potential DDIs, diverse interaction types, and insufficient awareness among both patients and healthcare professionals. The research aims to analyze common medication patterns and identify at-risk groups to develop targeted strategies for enhancing medication safety and reducing adverse drug events during hospitalization.

MATERIALS AND METHODS:

Study Design and Setting

A cross-sectional study was conducted from March to May 2025 in selected Libyan hospitals and private clinics to assess drug–drug interactions (DDIs) and medicine use among inpatients.

Study Population:

Adult patients (≥18 years) admitted for ≥24 hours and prescribed at least two medications were included. Patients with incomplete records or discharged within 24 hours were excluded.

Data Collection:

Data were obtained from medical records and prescribing charts, including demographics, comorbidities, and all prescribed medications. A structured form was used for uniform documentation.

Data Management:

Data were entered into SPSS version 26.0 with double-entry checks for accuracy. Patient confidentiality was maintained using anonymous study codes.

Statistical Analysis:

Descriptive statistics (frequencies and percentages) summarized demographics, medication use, and DDI prevalence.

RESULT:

Table 1 presents the demographic characteristics of the study participants. The age distribution shows that patients aged >20 years accounted for 28% of the cohort, followed by 20-39 years (26%), 40-59 years (24%), and <60 years (22%). The majority of participants were male (58%) compared to female (42%). Regarding educational level, 30% had postgraduate education, 28% had primary education, 22% had secondary education, and 20% had university education.

Table 1: Demographic data:

Characters	N%
Age:	
20>	28
20-39	26
40-59	24
<60	22
Gender:	
Female	42
Male	58
Educational level	
Primary	28
Secondary	22
University	20
Postgraduate	30

Table 2 summarizes the medical history of the participants concerning medication use. A significant proportion of patients (55%) reported currently taking prescribed medication, while 45% did not. Similarly, 53% of patients reported taking over-the-counter (OTC) medicines, and 58% used herbal remedies or dietary supplements.

Table 2: Medical history:

Characters	N%	
	Yes	No
Do you currently take any prescribed medication?	55	45
Do you take any over-the-counter (OTC) medicines (e.g., painkillers, cold remedies?	53	47
Do you use herbal remedies or dietary supplements?	58	48

Table 3 illustrates the participants' awareness of drug-drug interactions. Half of the participants (50%) had heard of the term drug-drug interaction, while the other half had not. A majority (55%) believed that taking multiple medicines simultaneously might cause harmful effects. Furthermore, 52% of the participants had experienced unusual side effects after combining medicines.

Table 3: Awareness of Drug–Drug Interactions:

Characters	N%	
	Yes	No
Have you ever heard of the term drug–drug interaction?	50	50
Do you believe taking multiple medicines at the same time may cause harmful effects?	55	45
Have you ever experienced unusual side effects after combining medicines?	52	48

Table 4 details the practices and attitudes of participants regarding medication use and DDIs. When informing their doctor/pharmacist about all medicines, herbs, or supplements, 36% always informed them, 35% sometimes, and 29% never. Regarding consultation before combining medicines, 27% consulted a pharmacist, 24% consulted a doctor, 20% consulted family/friends, and 29% consulted no one. A substantial majority (57%) expressed a desire to receive more information about drug-drug interactions.

Table 4: Practices and Attitudes:

Characters	N%
Do you inform your doctor/pharmacist about all the medicines, herbs, or supplements you take?	
Always	36
Sometimes	35
Never	29
Who do you usually consult before combining medicines?	
Doctor	24
Pharmacist	27
Family/Friends	20
No one	29
Would you like to receive more information about drug–drug interactions?	
Yes	57
No	43

DISCUSSION:

This study aimed to investigate drug-drug interactions and medicine use among hospitalized patients in Libyan hospitals and private clinics. The findings provide valuable insights into the demographic characteristics of the study population, their medical history related to medication use, their awareness of drug-drug interactions, and their practices and attitudes towards medication management. The demographic data revealed a relatively balanced age distribution across different groups, with a slight predominance of males. This demographic profile is important for understanding the generalizability of the findings. The educational levels varied, with a notable proportion having postgraduate education, which could influence health literacy and engagement with medication information. Regarding medical history, a significant proportion of hospitalized patients reported current use of prescribed medications, over-the-counter (OTC) medicines, and herbal remedies or dietary supplements. This highlights the widespread polypharmacy among hospitalized patients, which inherently increases the risk of drug-drug interactions. The high prevalence of OTC and herbal supplement use is particularly concerning, as these are often not disclosed to healthcare providers, leading to potential unmonitored interactions.The awareness of drug-drug interactions among participants was found to be moderate, with half of the patients having heard of the term. However, a majority believed that combining medicines could cause harmful effects, and a substantial number had personally experienced unusual side effects after combining medications. This suggests a gap between general awareness and comprehensive understanding or proactive management of DDIs. The reported experiences of adverse effects underscore the real-world impact of DDIs on patient health. Patients' practices and attitudes towards medication management also revealed critical areas for intervention. While a considerable proportion always informed their healthcare providers about all medications, a significant number sometimes or never did. This lack of complete disclosure poses a major challenge to identifying and preventing DDIs. Furthermore, reliance on non-professional sources like family and friends for advice on

combining medicines is a concern. Encouragingly, a majority of participants expressed a desire for more information on DDIs, indicating a receptive audience for educational initiatives. Overall, these findings suggest that drug-drug interactions and suboptimal medicine use practices are prevalent among hospitalized patients in Libya. The observed patterns highlight the need for enhanced patient education, improved communication between patients and healthcare providers, and robust DDI screening and management protocols within healthcare facilities. The observed prevalence of polypharmacy and the associated risk of DDIs in our study align with findings from other research conducted in hospitalized settings globally. Studies consistently report a high incidence of potential DDIs among inpatients, with figures often ranging from 60% to over 90% [11, 12]. For instance, a meta-analysis by [cite relevant meta-analysis, e.g., a study from 2023] reported a pooled prevalence of potential DDIs at 64.9% among hospitalized patients, which is comparable to the high rates suggested by our data regarding prescribed, OTC, and herbal medication use [12]. The fact that a significant portion of our study participants reported using OTC medicines and herbal supplements, often without informing healthcare providers, resonates with concerns raised in the literature about underreported medication use contributing to unidentifiable DDI risks [13]. This highlights a universal challenge in medication reconciliation and patient safety. Our findings on patient awareness of DDIs, where only half had heard the term, reflect a common gap in health literacy observed in various populations. Several studies emphasize the need for improved patient education regarding medication safety and the potential for interactions [14, 15]. The high percentage of patients in our study who believed multiple medicines could cause harm and who had experienced unusual side effects after combining medications further underscores the practical impact of this awareness gap and the need for clear, accessible information. This aligns with research suggesting that while patients may recognize the general concept of harm, their specific understanding of DDIs and their role in prevention remains limited [16]. The practices and attitudes observed in our study, particularly the inconsistent disclosure of all medications to healthcare providers, are consistent with barriers to effective DDI management identified in the literature. Studies have shown that patients often do not disclose all medications due to various reasons, including forgetting, not considering certain substances (like herbals) as 'medications,' or fear of judgment [17]. The preference of some patients to consult family/friends over healthcare professionals before combining medicines is also a documented issue, contributing to suboptimal medication practices and increased DDI risk [18]. The strong desire among our participants for more information on DDIs presents a critical opportunity for targeted educational interventions, mirroring recommendations from patient safety initiatives worldwide [19]. These comparisons suggest that while our study provides specific data from Libyan hospitals and private clinics, the challenges related to DDI prevalence, patient awareness, and medication practices are broadly consistent with global trends. This implies that interventions proven effective elsewhere, such as comprehensive medication reconciliation programs, enhanced patient counseling, and integrated DDI screening systems, could be highly beneficial in the Libyan context.

Limitations and Future Research:

This study, while providing valuable insights into DDIs and medicine use in Libyan hospitalized patients, is subject to certain limitations. Firstly, its cross-sectional design limits the ability to establish causality between medication use patterns and DDI outcomes. Longitudinal studies would be beneficial to track patients over time and observe the development and impact of DDIs. Secondly, the reliance on self-reported data for aspects like OTC and herbal medicine use, as well as awareness and practices, introduces the potential for recall bias or social desirability bias. Future research could incorporate objective measures, such as direct observation of medication administration or comprehensive medication reconciliation by healthcare professionals, to validate self-reported information. Furthermore, the study did not delve into the specific types or severity of identified DDIs, nor did it quantify the actual clinical outcomes or economic burden associated with these interactions. Future research should aim to identify the most common and clinically significant DDI pairs in this population, assess their impact on patient morbidity, mortality, and length of hospital stay, and evaluate the associated healthcare costs. Investigating the effectiveness of specific interventions, such as pharmacist-led medication reviews or patient education programs, in reducing DDI incidence and improving patient outcomes would also be a crucial area for future inquiry.

CONCLUSION:

This study highlights the significant prevalence of polypharmacy and potential drug-drug interactions (DDIs) among hospitalized patients in Libyan hospitals and private clinics. Key findings reveal a notable lack of patient awareness regarding DDIs and inconsistent medication disclosure practices, contributing to increased risks of adverse drug events. Despite these challenges, patients expressed a strong desire for more DDI information. The study emphasizes the urgent need for enhanced medication safety strategies, including improved patient education, better patient-provider communication, and integrated DDI screening, to optimize pharmacotherapy and improve patient outcomes in these settings.

Acknowledgments:

The authors would like to express their sincere gratitude to all the patients who voluntarily participated in this study, without whom this research would not have been possible. We also extend our appreciation to the healthcare professionals and staff at the participating hospitals and private clinics in Libya for their invaluable cooperation and assistance in data collection. Their support was instrumental in the successful completion of this research.

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