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# Medication errors occurrence and reporting: A qualitative study of the Jordanian nurses' experiences

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ABSTRACT

**Background & Aim:** Medication errors are a significant concern in healthcare, with effective management largely dependent on understanding its causes and reporting practices. This study aims to explore the experiences of Jordanian nurses in relation to medication error occurrence and reporting within the Jordanian context and the factors that may influence their decisions to report or not.

**Methods & Materials:** A qualitative descriptive approach was used. 24 nurses from three different hospitals were interviewed. The hospitals included a major governmental institution, a private facility, and a university hospital, ensuring diverse healthcare settings. Data were analyzed using Braun and Clarke's thematic analysis, and the study was reported guided by the COREQ checklist.

**Results:** Three major themes were identified: Obsolete policies and guidelines, Adapting to an Unhealthy Environment, and Trying to adjust: creating own definition for MEs. In our study, medication errors emerged as a pervasive issue across Jordanian hospitals, attributed to both systemic failures and individual practices. Despite existing policies, participants reported frequent MEs due to obsolete guidelines, lack of adherence, and an environment that hinders effective medication administration.

**Conclusion:** The study reveals the critical issues of medication errors in Jordanian hospitals due to outdated policies and challenging environments. It emphasizes the need for updated protocols and a culture supportive of error reporting. Addressing these factors is essential for improving patient safety and healthcare quality.

## Introduction

Medication errors (MEs) represent a significant challenge to global healthcare systems, impacting patient safety at multiple stages, including prescription, preparation, and administration. These errors, involving a spectrum of healthcare professionals such as physicians, nurses, and pharmacists, have profound implications ranging from minor inconveniences to severe outcomes, including patient death, hospitalization, and escalated healthcare costs (1-4). Despite the recognition of MEs' severity and their widespread consequences, strategies for their documentation and reporting are crucial yet remain inconsistently implemented across various regions, particularly in places where effective interventions, especially in documentation and reporting through systems, are essential yet often lacking (5-7).

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In Jordan, unlike in many developed countries, there is no unified medication error reporting system or national policy. The scarcity of official statistics and the limited scope of existing studies, often cross-sectional, impede a comprehensive understanding of the issue and the development of effective interventions. This study seeks to answer the question, "What are the experiences of Jordanian nurses in relation to medication error occurrence and reporting, and the factors that may influence their decisions to report or not.?"

A review of existing literature, including a systematic review by Mutair et al. (2021), indicates a concentration of research on ME reporting practices primarily in developed countries such as the United States and the United Kingdom. This body of work underscores the importance of a proactive, transparent approach to ME detection, measurement, and analysis, alongside fostering a culture of reporting among healthcare professionals to unearth opportunities for improvement and root cause analysis (6). However, there remains a notable research gap in understanding ME reporting practices in many regions, including Jordan, where research on ME reporting is sparse and primarily focuses on the presence of errors rather than reporting practices (8).

The scarcity of research in Jordan is particularly concerning given the critical role nurses play in the medication administration process and the known issues of underreporting due to fear of repercussions and negative work culture. Nurses, crucial in the medication administration process, are often central to these errors and their reporting. However, studies reveal that underreporting is common due to factors like fear of consequences and negative work culture (9-11). A preliminary investigation into the barriers to ME reporting in Jordan suggests a complex interplay of factors influencing reporting behaviors, yet comprehensive insights into these dynamics remain largely unexplored.

Given the complexity of factors influencing ME reporting behavior, including cultural, systemic, and personal dimensions, this study adopts a qualitative approach. A qualitative study allows for an in-depth exploration of nurses' perceptions, attitudes, and experiences with ME reporting in Jordanian hospitals. Through this method, we seek to uncover nuanced insights that can inform the development of targeted interventions to enhance ME reporting practices and ultimately patient safety in Jordan. This approach is exemplified by the proactive and transparent measures adopted in countries like the US, where the Food and Drug Administration receives over 100,000 ME reports annually, and in the UK, where a significant portion of MEs in England's medication treatment process occurs in primary care (3, 12, 13). This study aims to fill the gap in understanding the specific factors that influence the reporting of MEs by nurses in Jordan, contributing to the global body of knowledge by providing insights from a context significantly underrepresented in the existing literature.

## Methods

In this study, a qualitative descriptive approach was used. According to Creswell and Creswell (14), a qualitative research design allows a thorough exploration of the research problem and the discovery of relevant information when there is a lack of data about it. The Consolidated Criteria for Reporting Qualitative Research (COREQ) were used to ensure transparency and rigor in conducting and reporting our data gathering and analysis.

This study was conducted in three leading hospitals representing the healthcare sectors in Jordan; a major governmental, private, and a university hospital; all three receive many patients and provide extensive healthcare services. Jordan is a Middle Eastern country with a population of about 11 million people. The country is classified as a low-income country with the healthcare system striving to maintain safety and quality in the middle of challenging conditions.

Participants were recruited using a purposive sampling strategy, aimed at selecting individuals who have direct experience with the phenomenon under study, in this case, medication administration errors. This approach was chosen to ensure that participants could provide in-depth insights into the reporting of medication errors, informed by their firsthand experiences. The inclusion criterion of more than three months of work experience was established to ensure that participants had sufficient practical exposure to the medication administration process within the hospital setting.

Registered nurses with at least a bachelor's degree in nursing, who had completed basic nursing competencies, and had experienced a medication administration error, were identified for participation. To find these nurses, the research team collaborated with hospital administration departments, which facilitated the identification of potential participants who met the inclusion criteria. The research team also reviewed incident reports related to medication errors to identify potential participants who had experienced or reported medication administration errors.

Data saturation was determined when no new themes or insights were observed in the data, which occurred after interviewing twenty-four registered nurses. This point of data saturation ensured that the collected information was sufficient to understand the phenomenon thoroughly without unnecessary repetition.

After obtaining the ethical and administrative approvals from the ethics committees and the involved hospitals, the principal author met with the heads of the hospital departments to explain the study's goals, questions, and processes. Following that, all nurses were contacted for the first time. The primary author went around to each department's nurses and handed out invitation letters, the letter contained information about the study and a consent form for participation. The author was keen to answer as many queries as possible from nurses. The invitation letters were returned to a box placed on nursing counters. The author started interviewing the nurses who returned the invitation letters with signed consent forms.

The data was gathered using semi-structured face-to-face interviews. An interview guide was constructed based on similar studies in the literature and the author's personal experience (Table 1), the interviews were organized from 30 minutes to 1 hour. The interview guide and questions were subject to change depending on the data that emerged from the interviews. Interviews were held in a private room within the workplace, and only one per day was done. The principal author did all the interviews.

**Table 1.** Interview guide questions

| Interview guide questions |
|---|
| 1. Tell us what you think about the Medication Error (ME) phenomenon in Jordan. How do you think this phenomenon exists in Jordanian settings? |
| 2. How do policies and guidelines help in reducing the incidence of MEs? |
| 3. What are the main reasons for MEs in Jordanian health settings? How do these reasons increase MEs? |
| 4. Do you think that Jordanian nurses report MEs? Tell me more about this subject … |
| 5. How can we improve reporting MEs in Jordan? |
| **6.** Do you think that Jordanian culture has a role in covering MEs? How does this lead to under-reporting MEs? |

All interviews were taped and transcribed immediately afterward. All the transcripts were returned to participants for comments and/or correction. The NVivo software was used to organize and control the data. The authors chose Braun and Clarke's (15) thematic analysis technique. For theme analysis, Braun and Clarke (15) identified six steps. The first step was familiarization, which was accomplished by carefully listening to the taped interviews and reading and rereading the transcript. The next stage was to create initial codes by going over all interviews line by line and asking, "What did this individual want me to understand by saying this?" At this point, many free codes had been created. The third phase involved looking for themes and assigning one or more codes to each respondent's sentences, phrases, and paragraphs. The fourth step involved reviewing and refining the themes to minimize their quantity, eliminate duplications, and create more advanced analytical categories. Defining and naming themes was the fifth phase. The final step in the thematic analysis process was to write the report.

This study was designed to ensure a high level of rigor in exploring medication error reporting among Jordanian nurses. To start with, the study employed a qualitative descriptive approach that is particularly well-suited to uncovering the experiences and perceptions of participants in complex healthcare settings. Furthermore, several methodological consideration were followed:

- Methodological Transparency: The research process was conducted and reported in accordance with the COREQ checklist, which promotes transparency in reporting qualitative research and adherence to recognized standards (16).
- Purposive sampling: A purposive sampling strategy was utilized to select a sample of 24 registered nurses with diverse experiences and backgrounds in different healthcare settings who have experienced incidents of medication errors, thus enriching the depth and breadth of the collected data (17).
- Data saturation: The sample size was determined by the point of data saturation, ensuring comprehensive coverage of the research questions without unnecessary data collection (18).
- Analytical rigor: Thematic analysis was conducted using Braun and Clarke's robust six-step process, ensuring systematic identification, analysis, and reporting of themes (19).
- Researcher reflexivity: The research team engaged in ongoing reflexivity to acknowledge and mitigate potential biases, with the principal author conducting all interviews to maintain consistency in data collection (19).

These methodological choices provided a foundation for the trustworthiness of the study conclusions. After getting the Institutional Review Board (IRB) approval from the Applied Science Private University (Ref #:2022-2023-2-7) and involved hospitals, all participants signed written informed consent before starting data collection. Participants were given the option to leave the study and were assured that their personal information would be kept private. Only the research authors had access to their responses, maintained in a password-protected file on a private computer. Pseudonyms were used in place of their actual names.

## Results

The study engaged a balanced group of nurses in terms of gender, with equal representation of males and females. The participants were predominantly in their mid-twenties to mid-thirties, with a few being younger or older, showcasing a range of perspectives across different age groups. In terms of educational background, most participants held Bachelor's degrees, with a few having attained Master's or PhD degrees, indicating a mix of academic experiences. Their professional experience in nursing and specifically in medication administration varied, ranging from those just beginning their careers (1 yr) to those with several years of experience.

The majority of these nurses were employed full-time across various clinical settings. Many worked in critical care units and general wards, with a few in emergency departments, reflecting diverse clinical experiences. They were employed in different health sectors, including private hospitals, teaching hospitals, and governmental institutions, contributing to a wide range of insights into nursing practices in different organizational contexts. Table 2 details the participants characteristics.

**Table 2.** Participants characteristics

| Variable | | % |
|---|---|---|
| **Gender** | Females | 50% |
| | Males | 50% |
| **Age** | 20s to early 30s | 70% |
| | Below 20s and above 30s | 30% |
| **Educational Background** | Bachelor's degrees | 80% |
| | Master's degrees | 15% |
| | PhD degrees | 5% |
| **Professional Experience** | Beginners (1 Yr) | 20% |
| | Several years of experience: | 80% |
| **Employment Status** | Full-time | 90% |
| | Part-time/Other | 10% |
| **Clinical Setting** | Critical care units | 40% |
| | General wards | 40% |
| | Emergency departments | 20% |
| **Health Sector** | Private hospitals | 33% |
| | Teaching hospitals | 33% |

Three major themes were identified: Obsolete policies and guidelines, Adapting to an Unhealthy Environment, and Trying to adjust: creating own definition for MEs.

**Theme 1: Obsolete policies and guidelines**

MEs were considered a serious problem present in all the Jordanian hospitals. All participants confirmed the existence of errors in Medication Administration (MA). Some interviewees indicated that these errors usually result from a lack of commitment regarding MA rights.

*"MEs include any action contrary to the five rights of the MA process: wrong patient, dose, time, route, and medication. If a nurse gives medication and forgets to document it, this may lead to an overdose error because the medication may be given again to the patient." [Interviewee 16, RN, university hospital]*

The participants indicated that MEs occur, although some policies and protocols are supposed to guide the MA process. These policies were viewed by many of the interviewees as a vital source of information that supports nurses if detailed, updated, and available. However, it was explained that the current policies are ineffective in changing the situation. The participants explained that MA policies and guidelines are usually written on paper but not followed.

*"It is not effective until now. They put policies for MA that are supposed to be our reference in case of doubt about a certain issue related to MA, but, until now, errors have been covered." [Interviewee 18, RN, private hospital]*

Participants confirmed that the aim of the MA policies to enhance patient safety is not met. Some participants explained that nurses do not follow these policies or protocols, limiting their practical use.

*"Even in high-level healthcare institutions ... they do not follow the correct way of MA as mentioned in the policy." [Interviewee 1, RN, university hospital]*

For some participants, following the protocols of MA was illogical because these protocols have defects and need to be modified. These participants explained that most of the policies and guidelines were general and did not provide adequate information about some technical issues in MA, such as the way of giving the medication, the solution that should be used to dilute the medication, and the time allocated to provide each medication. Therefore, nurses, especially new ones, will follow the instructions from their more experienced peers rather than following updated, evidence-based, and specific policies or protocols.

*"Unfortunately, I saw nurses who give strong antibiotics like Amikacin to a patient push (directly into the vein). I usually read about each medication before giving it to the patient. Other nurses do not know about the correct way of giving medication because there is no clear protocol for giving antibiotics in our hospital. So, they follow the senior nurse's traditional way of working here. If one nurse gives medication wrongly, other nurses will make the same error without recognizing that." [Interviewee 13, RN, private hospital]*

**Theme 2: Adapting to an unhealthy environment**

It was clear in participants' narratives that they talked about an unhealthy environment that precipitates errors and discourages reporting. From the participants' perspectives, it seems that the environment is the root cause of the errors and even the lack of reporting.

According to participants, medication errors usually result mainly from distractions from the environment, which results in a lack of attention, happening in most cases as a result of a high load and pressure on nurses.

"... their mind is busy with many things. For example, some medication should be diluted in dextrose water, and the nurse may dilute it in saline." [Interviewee 1, RN, university hospital]

*"... when assigning a nurse to provide care for three ICU patients. The nurse will try to finish everything quickly and be required to give medications to all these patients simultaneously. So, in this situation, the nurse may forget to give some medications." [Interviewee 1, RN, university hospital]*

Most participants talked about the violation of the MA procedures as the primary leading behavior in causing MEs. Nurses breach

the protocols or deviate from the clinical area standards for safe drug administration when they are overloaded and under the pressure of time.

*"Lots of pressure and overload lead to improper actions… For example, misreading and lack of checking medication vials before preparing and giving them. This leads to giving an extra or less dose than recommended. Some vials contain 500 mg of medicine, and the needed dose is one gram... Some nurses only give one vial instead of two, and others may sign without giving the medication." [Interviewee 20, RN, private hospital]*

Nurses' actions in case of error vary and depend on the consequences of MEs. Most of the participants stated that they directly notify about MEs incidents to the in-charge or manager on duty and then document it. This action is usually taken if severe complications are anticipated or took place, or when the level of care changes or other interventions are needed to correct the error.

*"If MEs occur and it is serious, I will inform my manager and the responsible physician on duty ... then if there is a need to change the level of care because of an adverse effect, then I will write a report." [Interviewee 7, RN, private hospital]*

Another participant confirmed, saying:

*"If we look at the complications following MEs. Sometimes, nurses will not write, and they will deal with the situation as if nothing happened." [Interviewee 16, RN, university hospital]*

**Theme 3: Trying to adjust: creating own definition for MEs**

As part of the adaptation process to this unhealthy environment, it seems that nurses have come up with their own definition of Medication Errors (MEs). They consider an incident an ME only if it causes harm to the patient. They underestimate the errors that do not cause direct harm to patients' health.

*"MEs include any mistake that leads to harm or complications for the patient." [Interviewee 1, RN, University Hospital]*

Another major issue raised by participants is the importance of creating a safe culture for reporting MEs. Many interviewees suggested changing the administrative objectives in handling MEs from focusing on punishment and blame, as is currently the situation in most contexts, to focusing on improving the safety of care provided to patients. Participants described a current dichotomy between what the managers say in meetings, orientation sessions, and theoretical training, and what they actually practice when an ME occurs.

Many participants directly linked nurses' feelings of being supported and empowered by their administrators to increased patient safety and easier communication. One participant warned against leaving nurses alone to face patients' families or courts.

*"Try to listen to nurses, understand the problem, and work together as a team, both administrators and staff. This leads to improving the quality of care for our patients." [Interviewee 8, RN, Governmental Hospital].*

Finally, participants described an ineffective system of reporting and several drawbacks in the reporting system, such as the current reliance on a manual incident reporting system, which was considered by participants as obsolete and a waste of time due to its vulnerability to loss, manipulation, and difficulty in tracking. One participant talked about the importance of shifting from paper to electronic reporting systems. This was thought to facilitate modifications and corrections to the information written in the report. It will also reduce the time wasted on paperwork and protect from loss, manipulation by uninvolved parties, and facilitate tracking and follow-up on incidents. Participants said:

*"In our system, everything is manual and time-consuming. We need to add technology that facilitates the reporting process. It will make a significant difference." [Interviewee 12, RN, Private Hospital]*

*"The current system is a waste of time; papers are lost, hidden, and not followed up. You can't track these incident reports, and many times you don't hear back anything unless there is punishment or blame." [Interviewee 20, RN, Private Hospital]*

Moreover, many participants emphasized the importance of giving feedback to nurses at the end of the ME reporting process. All staff should see this feedback in the department where the incident occurred. This feedback could be presented to staff by conducting periodic lectures and discussing these errors and incidents and how they could be avoided in the future. Other suggestions included conducting departmental meetings, which should include all staff in the department with a quality department representative to discuss the problem. The aim of the meeting should be to improve practice rather than pointing fingers.

*"In this situation, they should organize a meeting with all unit nurses and discuss the problem and solutions with the quality department officer. In this case, all staff in the unit benefit from the incident, and all of them will be more cautious when administering medication in the future, instead of being afraid and not reporting." [Interviewee 9, RN, University Hospital]*

Most interviewees emphasized the importance of educating nurses, especially new nurses, about the process of reporting MEs. They indicated that this practical knowledge is seldom taught at nursing schools in the country. This education should include several steps, such as demonstrating the importance of reporting to change their negative views. Nurses should also understand the role of the reporting process in decreasing future MEs, which may help institutions improve their services. Educational sessions should cover the measures taken by the administration in the case of MEs.

*"Most nursing schools teach some issues about ME reporting. However, this education is theoretical, and the clinical area is greatly different. Therefore, newly graduated nurses lack experience regarding these issues. So, when they face this situation, they ask their colleagues, each of whom carries their views and experience." [Interviewee 13, RN, Private Hospital]*

*"Education is a crucial part of this subject to improve nurses' knowledge and skills and change the negative views they usually hold about the reporting process." [Interviewee 9, RN, University Hospital]*

An important educational opportunity is the orientation programs for new employees. Most participants recommended improving the orientation program to help nurses be competent and timely in (MA). Some participants recommended interactive learning in clinical settings, including asking and answering nurses' questions directly in the clinical area and moving educational sessions from traditional classrooms to the actual clinical environment. Some participants emphasized mandating nurses to attend all the MA training programs.

*"Nurses need more learning about MA. They should not be given a permit to deal with medications unless they finish the training and competency courses. These courses should be effective, unlike the courses in our hospitals where, in two days, they finish all nursing orientation programs. These programs need months. An interactive way of learning is more effective than a theoretical way; interactive learning could benefit both new and old staff." [Interviewee 8, RN, Governmental Hospital]*

## Discussion

This study elucidated the intricacies of medication errors (MEs) in Jordanian hospitals, focusing on occurrence, reporting behaviors, and contributing factors. Participants unanimously acknowledged MEs' presence, echoing concerns over the lack of a national database for tracking such errors, which aligns with findings from Al-Faouri, and Hayajneh (20) estimating the annual ME rates. This gap underscores the urgency of addressing MEs systematically, a sentiment supported by the National Coordinating Council for ME Reporting and Prevention in the USA (21) ().

A pivotal finding is the nurses' adaptive categorization of MEs, primarily recognizing errors only when they exacerbate patient conditions. This adaptation reflects a work culture that inadvertently discourages error reporting, a trend that is concerning for patient safety and nursing practice. The discrepancy between academic teachings and clinical realities further complicates nurses' understanding and handling of MEs(20)(21),

suggesting a critical gap between education and practice.

The study highlights a culture of underreporting rooted in fear of blame and punitive consequences, aligning with literature suggesting that a no-blame culture may foster more open reporting environments (22, 23). Policies and guidelines, although present, were deemed inadequate by participants, resonating with calls for clearer, more practical policies (23, 24)

Nurses cited slips, lapses, and intentional violations as primary causes of MEs, pointing to systemic issues like heavy workloads and insufficient staffing (25). Education emerges as a critical intervention point, with a need for targeted training for new nurses and a move towards more interactive, clinical-based learning to bridge the gap between theory and practice (26).

Surprisingly, many nurses restrict their definition of MEs to those causing direct harm, indicating a significant underreporting issue that may be more pronounced in Jordan compared to Western contexts (2, 23, 27) (. This reluctance is fueled by fears of punitive actions and stigmatization, a sentiment echoed across the Middle East and Asia (27, 28).

Recommendations include fostering a supportive, blame-free culture and revamping the reporting system to be more user-friendly and transparent, potentially through electronic means to enhance efficiency and feedback mechanisms (2, 23, 27, 29). Such changes are essential for promoting a safety-oriented culture within healthcare institutions.

In conclusion, the findings from this study illuminate the complex dynamics of ME reporting in Jordanian hospitals, emphasizing the need for systemic changes to policies, educational approaches, and the reporting culture. Addressing these issues is crucial for enhancing patient safety and the professional development of nurses within the healthcare system.

## Conclusion

The findings of this study underscore the critical nature of medication errors (MEs) within Jordanian hospitals, highlighting a culture that both provokes errors and discourages their reporting. The adaptation of nurses to this culture, by only acknowledging MEs that result in direct harm, points to a significant underreporting issue and a discrepancy between theoretical knowledge and clinical practice. These insights call for a multi-faceted approach to reform, emphasizing the development of clear, actionable policies and guidelines, fostering a blame-free reporting culture, and enhancing educational programs to bridge the gap between academic preparation and real-world demands. Implementing such changes is imperative to improve patient safety and support the professional growth of nurses, ultimately contributing to a more transparent, effective, and safe healthcare system in Jordan. This study not only fills a critical gap in the existing literature but also sets a foundation for future research and policy development aimed at mitigating medication errors and fostering a culture of safety and accountability within healthcare settings globally.

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