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### Challenges to and the future of medication safety in Saudi Arabia

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ORIGINAL ARTICLE

# Challenges to and the future of medication safety in Saudi Arabia: A qualitative study



Hisham Aljadhey <sup>a,\*</sup>, Mansour Adam Mahmoud <sup>a,b</sup>, Mohamed Azmi Hassali <sup>b</sup>,  
Alian Alrasheedy <sup>b</sup>, Amjad Alahmad <sup>a</sup>, Fahad Saleem <sup>b</sup>, Aziz Sheikh <sup>c</sup>,  
Michael Murray <sup>d</sup>, David W. Bates <sup>e</sup>

<sup>a</sup> College of Pharmacy, King Saud University, Riyadh, Saudi Arabia

<sup>b</sup> Discipline of Social and Administrative Pharmacy, School of Pharmaceutical Sciences, Universiti Sains Malaysia, Penang, Malaysia

<sup>c</sup> Centre for Population Health Sciences, The University of Edinburgh Medical School, Edinburgh, UK

<sup>d</sup> Purdue University College of Pharmacy and Regenstrief Institute, Indianapolis, IN, USA

<sup>e</sup> Harvard Medical School and Brigham and Women's Hospital, Boston, MA, USA

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## KEYWORDS

Medication Safety;  
Qualitative Study;  
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**Abstract** *Background:* Medication safety is a global concern among healthcare providers. However, the challenges to and the future of medication safety in Saudi Arabia have not been explored.

*Objectives:* We explored the perspectives of healthcare practitioners on current issues about medication safety in hospitals and community settings in Saudi Arabia in order to identify challenges to improving it and explore the future of medication safety practice.

*Methods:* A total of 65 physicians, pharmacists, academics and nurses attended a one-day meeting in March 2010, designed especially for the purpose of this study. The participants were divided into nine round-table discussion sessions. Three major themes were explored in these sessions, including: major factors contributing to medication safety problems, challenges to improving medication safety practice, and participants' suggestions for improving medication safety. The round-table discussion sessions were videotaped and transcribed verbatim and analyzed by two independent researchers.

*Results:* The round-table discussions revealed that major factors contributing to medication safety problems included unrestricted public access to medications from various hospitals and community pharmacies, communication gaps between healthcare institutions, limited use of important

\* Corresponding author. Address: College of Pharmacy, King Saud University, P.O. Box 2475, Riyadh 11451, Saudi Arabia.

E-mail address: [haljadhey@ksu.edu.sa](mailto:haljadhey@ksu.edu.sa) (H. Aljadhey).

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technologies such as computerized provider order entry, and the lack of medication safety programs in hospitals. Challenges to current medication safety practice identified by participants included underreporting of medication errors and adverse drug reactions, multilingualism and differing backgrounds of healthcare professionals, lack of communication between healthcare providers and patients, and high workloads. Suggestions for improving medication safety practices in Saudi Arabia included continuous education for healthcare professionals and competency assessment focusing on medication safety, development of a culture that encourages medication error and adverse drug reactions reporting, use of technology proven to decrease medication errors, and promotion and implementation of national patient safety initiatives.

*Conclusions:* Healthcare professionals have identified major challenges and opportunities for medication safety in Saudi Arabia. Policy makers and practitioners should consider these factors when designing future programs aimed at improving the safe use of medications.

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## 1. Introduction

Medication errors are common and preventable adverse drug events (ADEs) represent a major cause of harm. The incidence of medication errors and ADEs has been studied in many epidemiologic studies, particularly in developed country contexts (Bates et al., 1995; Gandhi et al., 2003; Morimoto et al., 2011; Benkirane et al., 2009; Honigman et al., 2001; Leape et al., 1995; Thomsen et al., 2007). For example, in the United States (US), one study found that 6.5% of hospitalized adult patients experienced ADEs, and 28% of these events were preventable (Bates et al., 1995). A more recent study from Japan reported an ADE incidence of 29 (95% CI; 27.7–30.7) per 100 admissions and medication errors of 15 (95% CI; 13.7–16.0) per 100 admissions. In Morocco, ADEs were found to occur at a rate of 11.5 (95% CI; 9.1–13.9) per 100 admissions (Benkirane et al., 2009). In the US, it is estimated that medication errors harm at least 1.5 million people, kill 106,000 people, and cost at least \$3.5 billion annually (Philip et al., 2006).

The overall incidence of ADEs in Saudi Arabia is unknown. However, studies have reported a prescribing error incidence of 8–56 per 100 medication orders in hospitalized patients (Al-Dhawali, 2011; Al-Jeraisy et al., 2011). It has been reported that 35% of medications dispensed without prescription in Saudi Arabia are prescription only medications (Bawazir, 1992). In addition, it was found that 37% of patients had a medication discrepancy at the time of hospital admission (AbuYassin et al., 2011), which could have been prevented by accurate reconciliation of medications.

The current situation and healthcare practitioner's perspectives about medication safety practices in Saudi Arabia are unknown. In this study, we adopted a qualitative approach to explore the views and opinions of healthcare practitioners toward current issues about medication safety in hospitals and community settings in Saudi Arabia, to identify challenges to improving it; and explore the future of medication safety practice.

## 2. Methods

### 2.1. Study design

We conducted an exploratory qualitative enquiry using group discussions for the generation of data. A topic guide was developed after conducting literature reviews of similar studies

(Hartnell et al., 2006, 2012; Phipps et al., 2009). The topics included in the guide for discussions were: current situation of medication safety practice in Saudi Arabia, medication safety issues, challenges and obstacles of medication safety and suggestions to improve medication safety in the country (see Appendix 1).

### 2.2. Sampling and recruitment

A list of experts in medication safety in Saudi Arabia was generated based on the authors' recommendations and personal contacts. Then, a personal email or phone invitation was sent to those experts to participate in a one-day meeting in Riyadh, Saudi Arabia. Participants came from government hospitals, private hospitals, academia, pharmaceutical industries and the Ministry of Health.

### 2.3. Data generation

Participants were divided into nine round-table discussion groups. Because of the culture in Saudi Arabia, females and males were seated in separate tables. Where possible, each group included at least one pharmacist, a physician and a nurse to facilitate discussion and the exchange of ideas between professionals from different backgrounds (Kitzinger, 1994). A facilitator was assigned in each group to facilitate the discussion in the three main areas of interest. The participants' filled a form to document their response to each question. A summary of the group's opinion in each theme was generated. In a plenary discussion, each facilitator shared their group summary with all participants by the help of a moderator. Thereafter, the moderator gave the chance for any participant to comment or add new points. During the discussion, if the moderator felt that the participant's statement was useful, further questions were asked, for example, "would you elaborate more on this?" The language of both, the plenary discussion and the round-table discussion was English.

### 2.4. Data coding and analysis

The plenary discussion was videotaped, transcribed verbatim and coded. Then, common themes were generated from the transcript by two independent researchers, using thematic content analysis (Felicity, 2002). The final coding and themes were approved by four authors through consensus. Confidentiality

and anonymity were guaranteed and all participants were informed that no data that can lead to identification of any participant will be published in any form. Saturation was assessed by reviewing the forms filled by each round-table discussion group.

### 3. Results

#### 3.1. Characteristics of participants

A total of 65 participants took part in the round-table discussion: 14 hospital pharmacists, 12 clinical pharmacists, 9 medication safety officers or hospital quality coordinators, 6 physicians, 5 pharmacy directors, 6 academics, 3 nurses, 3 health authorities, 3 community pharmacists, 2 representative from the pharmaceutical industry, and 2 pharmacy students. The majority of participants were females 41 (63%).

#### 3.2. Main themes

We present below the main themes arising from the discussions in each of the three broad areas of particular interest.

#### 3.3. Factors contributing to medication safety problems

When discussing the problems, causes, and weaknesses of current medication safety practice, participants pointed out many factors such as the limited use of technology, unrestricted public access to medicines from various hospitals and community pharmacies, communication gaps between healthcare institutions, and the lack of rigorous medication safety programs in hospitals. Other factors mentioned included the lack of trained staff in medication safety, such as medication safety officers; the unavailability or non-adherence to policies and procedures; and the unavailability or non-adherence to guidelines ensuring medication safety, such as the lack of proper labeling of medications, lack of standardized look-alike and sound-alike lists of drugs, and lack of implementation of medication reconciliation.

##### 3.3.1. Limited use of technology

Participants noted that a major contributor to prescribing errors was physicians' illegible handwriting. They suggested that computerized provider order entry (CPOE) might alleviate the problem. However, they recognized that a limited number of hospitals had adopted CPOE, and believed that those hospitals had not benefited as much as might be expected from CPOE. Pharmacy-information and bar-coding systems were also mentioned as important technologies that are lacking in most healthcare institutions in Saudi Arabia.

“One of the most important medication safety issues is of course the design and compatibility of CPOE. If it is not designed with functionality, taking into consideration effectiveness, and with modalities to actually generate results and reports to be able to work, otherwise you have a system that looks nice but does not really work and help patient safety” (Physician Round-table 1)

“There is a lack of information-exchange database between community pharmacies and hospital pharmacies in order to

access patient information, diagnosis, medication history, and laboratory results” (Pharmacist, Round-table 2)

“Even if we have CPOE, as we have in our hospital. If it is not fully integrated, we will have more mistakes, so we should have an excellent system” (Pharmacist Round-table 4)

#### 3.3.2. Unrestricted access to medications from different hospitals and community pharmacies across the country

Participants noted that medications are available to patients from different sources because patients can have medical files in several hospitals simultaneously. Also, regulations to eliminate unauthorized access to medication in community pharmacies are not enforced, even though they exist.

“For example, patients have files in different hospitals and they can still go to community pharmacies and buy whatever medications they request without any restrictions, and this will lead to a patient not having a clear and up-to-date medications list that a physician can depend on when the patient comes for a follow-up or admission” (Physician-Round-table 1)

“All the medications in our community pharmacies are over-the-counter, except narcotics, so you can dispense any medication for any patient” (Pharmacist- Round-table 4)

#### 3.3.3. Communication gaps between healthcare institutions

Participants believed that the communication between healthcare institutes has to be improved to avoid serious medication errors.

“A patient might get a prescription of controlled medication prescribed to him by the physician from one hospital and then go to another hospital and get the same medication again prescribed to him so, obviously there will be therapeutic duplication because of lack of unified communication tools between the hospitals” (Community Pharmacies Director, Round-Table 3)

#### 3.3.4. Absence of medication safety programs in hospitals

Most of the participants believed that underreporting of adverse drug reactions (ADRs) and medication errors is caused partially by insufficient basic medication safety training for healthcare providers and a lack of continuous education in medication safety issues.

“Each hospital has its own characteristics, each has to have its own medication safety program including committees, specialized medical staff, and medication error and ADR reporting systems” (medication safety officer, Round table 8)

### 3.4. Challenges to improving current medication safety practices

#### 3.4.1. Underreporting of medication errors and ADRs

Participants believed that underreporting of medication errors and ADRs is a considerable challenge to medication safety programs. They also mentioned that the lack of knowledge of medication errors and ADR reporting is a major barrier to reporting ADEs.

“We found that underreporting for most of the hospitals actually it’s worldwide, and one of the things that we discovered was that, most of the time, healthcare professionals do not know what to report and what exactly are the ADRs that should be reported” (Member of Regulatory Body-Round-Table 3)

“Yes there is resistant from physician to report ADRs, but what are you going to do? They are the primary frontline users. You have to invest money to make the system easier for them so that they don’t have to waste time” (Physician, Round-table 1)

#### 3.4.2. Multilingualism and different backgrounds

Participants highlighted issues relating to the cultural diversity and multilingualism among healthcare professionals who come from different backgrounds and different healthcare systems. Participants emphasized the impact on communication, especially with verbal orders.

“When we talk about verbal orders, it is important to consider the diverse multilingualism and multiculturalism of healthcare professionals that we have in most of the hospitals. We speak English with different dialects. So, the need for read back, talk to me, explain to me, and what you understood from me is very important to make sure he or she knows what I mean” (Physician, Round-table 1)

#### 3.4.3. Culture of safety

Some participants believed that fear of liability might be one of the challenges to proper medication safety practice.

“Most of the healthcare professionals will be reluctant to report ADRs or medication errors because they don’t want to get into trouble with the hospital administration” (Member of Regulatory Body, Round-table 5)

#### 3.4.4. Communication between healthcare professionals

Participants believed that communication barriers between healthcare professionals represent one of the most important challenges to better medication safety practice.

“The patient comes to me. I tell him one thing. He or she goes to the nurse, and she tells him another thing, and the pharmacist tells him something else. Then the patient is confused, so, we need to have a standardized communication tool” (Physician, Round-table 5)

#### 3.4.5. Communication between healthcare professionals and patients

Communication barriers between pharmacists and patients were also identified as one of the challenges. Some of the participants had an explanation for communication gaps between pharmacists and patients.

“There is no time for the community pharmacist to give counseling to patients, and even if he wants to, there is no private area for counseling” (Pharmacist, Round-table 4)

Social factors were another explanation for communication gaps between community pharmacists and patients.

“Females are reluctant to communicate freely with the pharmacist because all pharmacists in community pharmacies are males” (Pharmacist, Round-table 4)

#### 3.4.6. Work load or inadequate number of staff

Participants identified workload as one of the challenges and believed that it might contribute to medication errors.

“In our hospital, the number of medications dispensed by pharmacist is very huge; sometimes, it exceed 500 items per pharmacist, and the possibility of committing dispensing errors is high because of that” (Pharmacist, Round-table 4)

#### 3.5. Suggestions for potential areas to improve medication safety in Saudi Arabia

Participants were also requested to suggest improvements to current medication safety practice in Saudi Arabia. Participants suggested taking steps to establish a safety culture, continuous education for the healthcare staff, and continuous competency assessments that focus on medication safety. Further, participants also suggested increasing the awareness of healthcare professionals about the trend of medication errors and the need for a unified database to ensure continuity of care. They also raised the concern that there is not enough published research in medication safety, especially about the region, and articulated the need for rigorous research in medication safety and the enrollment of medication safety officers in hospitals.

##### 3.5.1. Research

Most of the participants strongly endorsed the need for more medication safety research to increase the understanding of the type and causes of medication errors in Saudi hospitals.

“A well-structured and published research in medication safety is a key element for improvement, because I know there are initiatives everywhere in different hospitals, but there is no well-structured and published research” (Hospital Pharmacy Director, Round-table 7)

##### 3.5.2. Continuous education and competency assessment

Continuous education and continuous competency assessments focusing on medication safety are needed to enhance the current practice and help train healthcare professionals about best practices in medication safety.

“Continuous education and continuous competency assessment of our medical staff or healthcare providers: we need to be sure that they are up to the level of taking care of our patients” (Physician, Round-table 1)

“Nurses are involved in administration of medications to patient and should be targeted and heavily involved in continuous education programs and competency assessment” (Nurse, Round-table 2)

### 3.5.3. Establish a culture of safety

“Even if they make an error, they keep it down so, in this way, you can’t even evaluate which direction you are running and you cannot improve” (Hospital Pharmacy Director, Round-table 4)

### 3.5.4. Need for wider use of technology

Most of the participants believed that the correct use of technologies will improve medication safety.

“Regarding prescribing errors, you can imagine that, sometimes, there is no dose, no dosage forms, and no frequency written” (Pharmacist, Round-table 6)

### 3.5.5. Need for national initiatives and support from the national accreditation body

Participants agreed that efforts on the national level need to be expanded to promote the implementation of medication safety practices.

“I think most hospital professionals are happy to learn they are eager to know about proper medication safety practice, so may be if we make the Saudi Central Board of Accreditation for Health Institutions (CBAHI) mandatory for all Saudi hospitals I am sure it will improve medication safety in our country” (medication safety officer, Round-table 8)

## 4. Discussion

We performed a qualitative study of provider beliefs and perspectives around medication safety in Saudi Arabia. Specific issues identified included unrestricted public access to medication from various sources, communication gaps, and the lack of rigorous medication safety programs in hospitals and the limited use of important technologies such as CPOE, even though when it was implemented it did not always have the desired effects.

Several studies have used qualitative approaches to understand the perspective of either healthcare professionals and/or patients toward various medication safety issues (Hartnell et al., 2006, 2012; Phipps et al., 2009; Avery et al., 2007; Creswell et al., 2012). In particular, medication errors and ADRs have received attention in previous work. Similar to our findings, a recent study reported that the main barriers to medication error reporting include organizational factors, such as fear of appraisal from management and/or administration; information gaps, such as lack of definition or standards for reporting medication errors; and the inability to recognize or identify medication errors (Phipps et al., 2009). Another recent study from Malaysia reported that the lack of knowledge of ADRs is a major factor contributing to underreporting (ElkalmiRM et al., 2011).

The National Pharmacovigilance Centre at the Saudi Food and Drug Authority (SFDA) made ADR reporting forms available online for healthcare professionals and patients. However, participants in this study were not satisfied with the number of ADRs submitted on a national level. In addition, incident reporting in Saudi Arabian hospitals is less widespread than reporting in other countries (Arabi et al., 2012; Panesar et al., 2009).

Pharmacists in the current study were concerned about the heavy workload of pharmacists, and believed that it might contribute to dispensing errors. Consistent with our findings, a study from Australia reported that an increase in workload created more opportunities for dispensing errors to occur in community pharmacies (Peterson et al., 1999). Another study from the US also found a positive correlation between the frequency of dispensing errors and the number of prescriptions (Szeinbach et al., 2007).

Communication is a fundamental aspect of clinical practice, both among healthcare professionals and between healthcare professionals and patients (Travaline et al., 2005; Kripalani et al., 2007). In support of our findings, a recent national study in Saudi Arabia reported that behavior and communication incidents among hospital staff were one of the major incidents reported through a voluntary incident reporting system (Arabi et al., 2012). At the community pharmacy level, another national study reported that few patients mentioned that pharmacists discussed with or counseled them on personal matters in a private area within the pharmacy (Bawazir, 2004). A systematic review revealed that deficits in communication and information transfer at hospital discharge are common and identified several interventions to facilitate patient-information transfer during continuity of care (Travaline et al., 2005). In Saudi Arabia, it was found that 37% of patients had a medication discrepancy at admission (AbuYassin et al., 2011), which could have been prevented by accurate reconciliation of medications.

International studies support the idea that medication errors can occur any time during the medication-management process and most commonly during prescribing (Bates et al., 1995; Avery et al., 2002). Similarly, in Saudi Arabia, clinicians are concerned about prescribing errors, and few studies have been conducted in both hospitals and primary care settings (Al-Dhawali, 2011; Al-Jeraisy et al., 2011; Neyaz et al., 2011a,b; Al-Faris, 1999; Mahfouz et al., 1997). Study participants were also very concerned about prescribing errors because of illegible handwriting. Similarly, a local study reported that 72% of the physicians in Saudi Arabia write low-quality prescriptions (Neyaz et al., 2011b). As a way to reduce or eliminate these errors, participants suggested the use of CPOE. It has been documented that CPOE has a positive impact on medication errors when implemented correctly (Bates et al., 1999). Nevertheless, recent studies reported that, computer system may also in some instances cause medication errors (Koppel et al., 2005; Kesselheim et al., 2011).

Our study had several limitations. Some participants might not have contributed to the discussion because of the large size of the plenary discussions. Most participants were pharmacists, and nurses or hospital administrators were included but relatively underrepresented especially nurses. In addition the inclusion of patients or their caregivers was not considered. Also the discussion was only one day and hence one-to-one discussion was not possible. Our result might not be generalizable beyond the Saudi context.

Future initiatives should consider the issues raised in this study in designing programs aimed at improving the safe use of medication. The study findings also highlighted the need for the implementation of interventional, research and educational services to ensure the safe use of medications.

These group discussions of healthcare professionals have identified major challenges and opportunities for medication safety in Saudi Arabia. Policy makers and practitioners may

consider these factors when designing future programs aimed at improving the safe use of medication.

### 5. Conflict of interest

None declared.

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### Appendix 1

- In your opinion, what are the important medication-safety problems encountered in the hospitals and the community setting?
- Prioritize these problems.
- What do you think causes these problems?
- How Saudi Arabia is unique compared to other western countries in this area?
- What are the strengths we have in medication safety in Saudi Arabia: these include resources, research, practice, and regulations?
- What are the weaknesses we have in medication safety in Saudi Arabia: these include resources, research, practice and regulations?
- What are the challenges that we should prepare for?
- What are the opportunities in improving medication safety in Saudi Arabia?

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