



## Original article

## Medication safety officer preparatory course: Outcomes and experiences

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## ABSTRACT

**Purpose:** Few hospitals employ a medication safety officer. A medication safety officer preparatory course was planned using a structured curriculum to prepare pharmacists with the knowledge and skills to start medication safety officer activities. The current study aims to assess the outcome, as change in knowledge, of a hospital medication safety officer preparatory course.

**Methods:** We conducted a three-day course in February 2011 in Riyadh, Saudi Arabia. It was developed to provide attendees with the essential knowledge and skills to become a medication safety officer. Teaching methodologies included didactic teaching, group discussions, case presentations, and an independent study of medication safety materials. The content of the course focused on the various roles of a medication safety officer, the importance of medication safety in a health care setting, the incidence of adverse drug events in a hospital setting, strategies to identify and prevent adverse events, the use of root cause analysis and failure mode and effect analysis, the role of an officer in hospital accreditation, and ways for promoting safety culture. Assessment of the course outcome was accomplished by comparing scores of knowledge level before and after the course. The knowledge level was assessed by a 20-item exam which was developed and validated by course instructors.

**Results:** Twenty-one participants attended the course and completed both the baseline and after-course assessment questionnaires. The majority was male (N = 14, % = 66.7) with a job experience of 1–5 five years (N = 10, % = 47.6). The knowledge score increased from 14.3 ± 1.90 (mean ± standard deviation) at baseline to 18.5 ± 1.43 after successfully completing the course (P < 0.001).

**Conclusion:** A three-day medication safety officer preparatory course has been shown to significantly improve attendee knowledge about medication safety. Educating health care professionals is an important tool to help ensure the safety of patients.

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## 1. Introduction

Medication-related problems are a major cause for hospitalization and commonly occur in hospitals (Al Hamid et al., 2014; Aljadhey et al., 2013a, 2013b). In a study in Saudi Arabia, the incidence of adverse drug events in hospitals was 8.5 per 100 admis-

sions, and 30% were preventable (Aljadhey et al., 2013a, 2013b). Pharmacists play a major role in the identification and prevention of medication errors (Joint Commission Resources, 2007; Alghamdi et al., 2012). Therefore, agencies like Joint Commission International (JCI) require hospitals to establish a solid role of pharmacy service to ensure medication safety in the premises (Joint Commission Resources, 2007). In a focus group study in Saudi Arabia, experts in medication safety and healthcare providers suggested the need for further practices of medication safety, promotion of safety culture, and education to improve medication safety (Aljadhey et al., 2014). One of the interventions and measures to prevent medication errors is the availability of a medication safety officer in the hospital who leads the hospital for improving the safety of the medication-use system in order to prevent medication errors. The Medication Safety Officer provides the medication safety expertise to the hospital and is involved in policy

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setting and practice change to improve the safe use of medications (ASHP, 2013). A national survey of 78 hospitals in Saudi Arabia found that core medication safety practices are not implemented in many hospitals, and few hospitals (9%) have a medication safety officer (Aljadhey et al., 2013a, 2013b). Therefore, a medication safety officer preparatory course was planned using a structured curriculum to prepare pharmacists with the knowledge and skills to start medication safety officer activities. The current study aims to assess the outcome, as change in knowledge, of a hospital medication safety officer preparatory course.

## 2. Methods

We conducted a three-day course in February 2011 in Riyadh, Saudi Arabia. The course was accredited for Continuous Pharmacy Education credit hours by the Accreditation Council on Pharmaceutical Education. It was developed to provide attendees with the essential knowledge and skills to become a medication safety officer.

This course was a joint venture between the King Saud University Medication Safety Research Chair in collaboration and King Faisal Specialist Hospital & Research Center Pharmacy Department. The collaboration between the two organizations included logistics and organization support, selecting the course topics, content and delivery methods, participating in providing lectures in the course. In addition to the continuous evaluation and future improvement of the course were shared between the two organizations participating members. The course targeted potential and newly assigned medication safety officers at hospitals, health care quality specialists or coordinators, health care risk managers, and other pharmacists with an interest in medication safety officer responsibility. The course duration was three full days from 8:30 am until 4:30 pm, and the course was divided into four sessions per day. At the end of the course, participants needed to successfully pass the assessment exam with a minimum score of 80% to earn the course certificate. The objectives of the course were developed and reviewed by the course instructors. These objectives ensured that the participants would gain comprehensive knowledge of general medication safety concepts, including medication safety culture in a hospital, error and adverse drug events reporting, identification and prevention strategies, in-depth review of the medication safety officer job description and responsibilities, the role of health care system accreditation programs in promoting and maintaining safe medication practices, and some health care quality concepts and tools, like root cause analysis and failure mode and effect analysis, which are necessary for proper medication safety assessment (Appendix A). The course was planned to help participants to become part of hospital-wide performance improvement activities and to develop effective ways on how to assure new policies and procedures are maintained and improved. The instructors were from major hospitals and academic institutions in Saudi

Arabia with considerable experience in medication safety. Teaching methodologies included didactic lectures, group discussions, case presentations, and an independent study of medication safety materials. All participants were provided with reading materials three weeks before the course began. On the first day of the course, all materials, including a schedule, session objectives, PowerPoint slides, cases, and reading materials, were given to each participant in a course packet. Twenty-one pharmacists from various regions of Saudi Arabia participated in this course.

A 20-item assessment exam was developed and reviewed by the course instructors. The exam was based on the topics and reading materials provided in the course. The attendees selected the

correct answer for each item among the presented multiple-choice answers. The assessment was conducted at baseline on the first day prior to starting the course and immediately at the end of the course. Before and after comparison of attendee knowledge level was done.

Statistical analysis was conducted using the Statistical Package for Social Science (SPSS) version 13. A non-parametric Wilcoxon-test was applied to compute the difference in the knowledge before and after the session. Alpha values less than 0.05 were considered significant.

## 3. Results

Twenty-one participants attended the course and completed both the baseline and after-course assessment exams. Of the 21 participants, the majority was male (N = 14, % = 66.7) with a job experience of 1 to 5 five years (N = 10, % = 47.6) (Table 1). Eight participants (38.1%) held a bachelor's degree in pharmacy. In the pre-evaluation session, the mean score of the respondents was  $14.3 \pm 1.90$  (mean  $\pm$  standard deviation). This score increased to  $18.5 \pm 1.43$  after the course (maximum score for the exam was 20) and was statistically significant ( $P < 0.001$ ). This increase in scores was consistent regardless of the participant's gender, job experience, or level of education.

## 4. Discussion

In Saudi Arabia, the need for more established and structured medication safety activities is a known challenge for the majority of the healthcare organizations.

Several efforts took place in different healthcare institution, to improve the clinical staff knowledge about essential medication safety theories and principles; such as the National Medication Safety Program at Ministry of Health in Saudi Arabia and the Basic Medication Safety Course by the King Saud Bin Abdul Aziz University for Health Sciences, National Guard Health Affairs, Saudi Arabia. Those programs included some relative information that would help improving the medication safety officer and other healthcare providers' knowledge and skills. In addition, a more structured medication safety program such as medication safety specialty residency program is would be of more value for inter-

**Table 1**  
Participants knowledge comparison before and after the course by Demographics.

Variable	N (%)	Knowledge Level (before course), Mean $\pm$ SD	Knowledge Level (after course), Mean $\pm$ SD
Total	21 (100)	Mean = $14.3 \pm 1.90$ Range [10–17]	Mean = $18.5 \pm 1.43$ Range [16–20]
Gender			
Male	14 (66.7)	$14.14 \pm 2.03$	$18.14 \pm 1.35$
Female	7 (33.3)	$14.85 \pm 1.67$	$19.14 \pm 1.46$
Job experience			
1–5 years	10 (47.6)	$14.40 \pm 2.03$	$18.20 \pm 1.93$
6–10 Years	5 (23.8)	$14.60 \pm 1.67$	$18.60 \pm 0.89$
11–20 Years	4 (19.0)	$14.12 \pm 0.51$	$18.0 \pm 0.68$
21–30 Years	2 (9.5)	$15.60 \pm 0.22$	$19.10 \pm 0.12$
Education Level			
Bachelor of Pharmacy	8(38.1)	$14.83 \pm 1.72$	$18.83 \pm 1.60$
Doctor of Pharmacy	6(28.9)	$14.42 \pm 1.90$	$17.7 \pm 0.95$
Master in Pharmacy	7(33.3)	$14.66 \pm 1.75$	$18.83 \pm 1.83$

\*Knowledge level is significantly higher after the course across all variables at  $P < 0.05$ .

ested pharmacist. However, such residency programs are lacking in Saudi Arabia.

In the medication safety officer preparatory course, a significant improvement was achieved in the attendee knowledge and skills about medication safety.

Although these short courses have a significant impact on attendee knowledge, it is important to include these topics within the curriculum of pharmacy schools. This will help students to gain the knowledge, skills, and attitude toward medication safety activities and responsibilities early on.

In a decade time, medical institutions are focusing more on teaching and practicing the concept of medication and patient safety (Association of American Medical Colleges, 2001). In developed nations, accrediting bodies emphasize adding patient safety contents to medical curriculums (Liaison Committee on Medical Education Accreditation). However, it is seen that a higher emphasis of patient safety exercise was for the practicing physician than that of the medical graduates (Battles and Shea, 2001; Association of American Medical Colleges, 2003; Kachalia et al., 2006). Keeping in view the worth of this issue, some American and Canadian Medical schools have taken initiatives to teach patient safety to their graduates (Barach (2000), Halbach and Sullivan (2005), Scobie et al. (2003), Patey et al., 2007; Madigosky et al., 2006; Moskowitz et al., 2007; Alper et al., 2009). The main purpose of such courses was to introduce the future practitioner to the concept of medication safety and errors handling (Dean et al., 2002). By doing so, the institutions provide an experiential opportunity to their students, which helps them to assess and analyze the safety aspects of medications. Such interactive opportunities were found to have a better impact on students' overall learning than traditional lecture-based activities (Madigosky et al., 2006; Moskowitz et al., 2007; Alper et al., 2009; Dean et al., 2002; Mayer et al. 2009). Furthermore, in recent years another major development in health care has been the multi-disciplinary approach to the pharmaceutical care process. In terms of medication safety, pharmacists play a major role in the identification and prevention of medication errors (Joint Commission Resources, 2007; Alghamdi et al., 2012). In addition, it is also an essential criterion of any health care accreditation agencies to establish a solid role of pharmacy service to ensure medication safety in the premises (Joint Commission Resources, 2007).

Nowadays in Saudi Arabia there is an increase in hospitals' interest in getting accreditation. Almost every public and private hospital is keen to accredit its health facility from a reputable accreditation body such as the JCI and Saudi Central Board for Accreditation for Healthcare Institution (CBAHI). Moreover, most hospitals are focusing on recruiting pharmacists as medication safety officers to improve the medication safety activities within the hospital. Unlike in developed nations, medication safety is a relatively new area in developing countries (Joint Commission Resources, 2007).

After the success of this course It was discussed and planned to continue providing this course at least in a biannual basis, to be able to provide the basic knowledge to the future medication safety officers not only in Saudi Arabia but also to other countries in the region. The course duration can be further increased to five days to possibly include more topics known to be important to a medication safety officer.

In conclusion, a three-day medication safety officer preparatory course has been shown to significantly improve attendee knowledge about medication safety. Educating health care professionals is an important tool to help ensure the safety of patients.

## Appendix A. Medication safety officer preparatory course program outline

Day	Time	Session title
Day I	8.30–10.00	Medication Safety, General Concept
	10.00–10.30	Coffee Break
	10.30–12.00	Medication Safety, General Concept. cont.
	12.00–01.30	Prayer and Lunch Break
	01.30–04.30	Root Cause Analysis (Adverse Drug Events)
End of day I		
Day II	8.30–10.00	Health Care, Failure Mode and Effect Analysis (FMEA)
	10.00–10.30	Coffee Break
	10.30–12.00	Health Care, Failure Mode and Effect Analysis (FMEA). cont.
	12.00–01.30	Prayer and Lunch Break
	01.30–04.30	Medication Safety Officer Job Description
End of day II		
Day III	8.30–10.00	ISMP Medication Safety Self-Assessment
	10.00–10.30	Coffee Break
	10.30–12.00	ISMP Medication Safety Self-Assessment. cont.
	12.00–01.30	Prayer and Lunch Break
	01.30–2.30	Medication Safety in Academia and Research
	2.30–4.00	Medication Safety and Hospital Accreditation
	4.00–5.30	Closing, Discussion, Exam & Course evaluation
End of Day III		

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