Original article

Addressing medication errors in an adult oncology department in Saudi Arabia: A qualitative study

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ABSTRACT

Objective: There is a wide range of strategies that could help in minimizing medication errors during healthcare delivery. We undertook a qualitative study to identify recommended solutions to minimize medication errors in an adult oncology department in Saudi Arabia from the perspectives of healthcare professionals.
Methods: This was a qualitative study conducted in an adult oncology department in Saudi Arabia. After obtaining the required ethical approvals and written consents from the participants, seven focus group discussions were carried out for data collection. A stratified purposive sampling strategy was used to recruit medical doctors, pharmacists, and nurses. NVivo Pro version 11 was used for data analyses. Inductive content analysis was adopted in the coding of collected data.
Result: Our study showed that improving organizational support, staff education, and communication could help in minimizing medication errors in the adult oncology department.
Conclusion: The adoption of multiple strategies is required to improve the safety of the medication process in the adult oncology department. We argue that the availability of supportive leadership should be prioritized as it plays a crucial role in determining the effectiveness and efficiency of both staff education and communication.

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1. Introduction

Medication errors are a persistent problem in many healthcare settings (Tshiamo et al., 2015). Medication errors can lead to serious consequences for both patients and healthcare organisations. For example, in the United States, more than 7,000 deaths per year occur due to medication errors (Anderson and Townsend, 2010). Moreover, medication errors can lead to hospital admissions (Assiri et al., 2018) and prolonged hospital stays; hence impacting negatively on healthcare expenditure as well as patient outcomes (Wittich et al., 2014).

The knowledge that half of the medication errors encountered during hospitalisation are avoidable (Kongkaew et al., 2013) means that there is much focus on identifying and implementing strategies to minimize medication errors. The focus of these strategies differs in terms of stage of the medication process, from prescription to administration (e.g. electronic prescribing and computerised physician order entry with clinical decision support systems, barcodes to track medications, interventions to reduce medication errors, medication error reporting systems) (Riaz et al., 2017). The views of healthcare professionals as to what may help improve medication safety have been sought in several studies (Jones and Treiber, 2010; Cunningham, 2012; Aljadhey et al., 2014). Consultations with healthcare professionals, especially those who are involved in medication process (prescribing, transcribing, dispensing and administering), have aimed to identify and implement practical solutions to address error and encourage healthcare professionals to work in a safety-promoting environment (Health And Safety Executive, 2014). Yet, although medication error is a major issue in Gulf countries (Alsaidan et al.,

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2018), there have been few studies looking at how to address medication error and patient safety in this context. To the best of our knowledge, there was only one Saudi Arabian study to date which considered the diversity of healthcare professionals' backgrounds on medication safety and included participants from government hospitals, private hospitals, academia, pharmaceutical industries and the Ministry of Health (Aljadhey et al., 2014). This study revealed that factors contributed to medication safety include unrestricted public access to medications, lack of communication between healthcare institutions, limited use of technologies, and lack of medication safety programs healthcare institutions. In contrast, the study we report here is situated in an adult oncology context where low index medication needs to be precisely prescribed, dispensed and administered (Ulas et al., 2015).

In an attempt to recommend improvements in medication safety in an adult oncology setting in Saudi Arabia, we conducted a survey-based study to evaluate patient safety culture among healthcare professionals working in this context (Alharbi et al., 2018). This study showed that teamwork across units, non-punitive response to error, handoffs and transition, communication openness, staffing, supervisors'/ managers' expectations and actions promoting patient safety, management support for patient safety and overall perception of patient safety need to be strongly considered in addressing error. Following this survey, we carried out a qualitative study in the same setting in order to explore healthcare professionals' perceptions of medication errors (Alharbi et al., 2019). We found that our participants perceived teamwork, staffing, the handover of medication-related information, accepted behavioural norms (e.g. fear of shame and normalising errors and near misses), the frequency of reported events, and non-punitive response to error as leading causes of medication errors in the adult oncology department. Following these two studies, the next step in recommending interventions to address medication error was to ask the healthcare staff to identify appropriate solutions to minimize medication errors in their workplace. The aim of this third study was to identify recommended solutions to minimize medication errors in an adult oncology department in Saudi Arabia from the perspectives of healthcare professionals.

2. Methods

2.1. Study setting and design

This qualitative study was conducted in the adult oncology department of a public hospital in Saudi Arabia. We conducted focus group discussions to provide insight into participants' shared appropriate solutions to minimize medication error (Savin-Baden and Major, 2013). Using of focus group discussion offered opportunity to generate data through discussion among participants to share their knowledge and opinions to obtain solutions to minimize medication errors in the department (Hays and Singh, 2011). The discussion topic guides were informed by findings of our two previous studies (Alharbi et al., 2018; Alharbi et al., 2019) and related literature (Al-Dhawailie, 2011; Almutary and Lewis, 2012; Aljadhey et al., 2014). Questions included, which area we should focus on for minimizing medication errors in the depart-

ment? How will we know if a change has been effective? How might these be changed?

2.2. Ethical considerations

The study was ethically approved by the institutional review board. Prior to starting the focus group discussions, an information sheet including a description of this study and participant right to withdraw was provided to potential participants. Written consent was obtained from each participant for participation in the focus group discussions and audio-recording. The collected data was only accessed by the authors to maintain confidentiality.

2.3. Sampling and recruitment

After obtaining ethical approval, we sent an explanatory email incorporating findings from the previous two studies to the medical director and the heads of doctors, pharmacists, and nurses within the adult oncology department inviting them to encourage staff to participate in the study. A stratified purposive sampling strategy was used to recruit medical doctors, pharmacists, and nurses who were involved either in prescription, preparation or administration of medication in the adult oncology department (Hays and Singh, 2011). To ensure confidentiality and openness, the researcher (WH) approached each healthcare provider individually to invite them to participate in the study. We intended to use single profession focus groups to improve the openness and transparency of discussion and encourage participants to share their views freely (Ritchie et al., 2013). The place and time of the focus group discussions were selected based on participant preference.

2.4. Data generation

Each focus group meeting was facilitated by the first author (WH) and started with 10 min presentation to introduce causes of medication errors identified in the two previous studies (Alharbi et al., 2018; Alharbi et al., 2019). Following the presentation, discussion about strategies to minimize medication errors was carried out. All focus group discussions were recorded and then transcribed verbatim. Focus group discussions were conducted in July 2018, in English. The average length focus group discussion was approximately 45 min. Data collection ended when no new themes were identified in the data set.

2.5. Data coding and analysis

All transcripts were anonymised then exported into qualitative data analysis software (NVivo Pro version 11) for coding and analysis. Each transcript was read several times by the first author (WH) to obtain the sense of the whole. Sections in the transcripts which were found to be linked with the study aim were selected as meaning units. According to Graneheim and Lundman (2004), meaning unit defined as "*words, sentences or paragraphs containing aspects related to each other through their content and context*" (Graneheim and Lundman, 2004). The meaning units were condensed and then labelled. The labels were then sorted into categories and sub-categories based on the manifest (explicit

Table 1
An example of the coding process (Based on Graneheim, Lundman 2004).

Meaning unit	Condensed meaning unit	Code	Sub-theme	Theme
"We can increase the number of staff, but we have limited space. You can't have 20 pharmacists in one area".	Limited space to have more staff.	Limited Space simulation	Improve Staffing	Improve Communication
"Using of stimulation is going to give the healthcare professionals more confidence in all medication administration processes".	Staff would gain more confidence by simulation.		Adoption of simulation	Staff education

meaning) of the text (Graneheim and Lundman, 2004) (see Table 1). Coding and categorization were discussed frequently within the research team (WH, JC, and ZM) to check the relevance and appropriateness of the codes and categories.

3. Results

3.1. Participant characteristics

Twenty-seven healthcare professionals participated in seven single-profession focus groups. Of the 27 participants, 16 were nurses, eight were doctors, and three were pharmacists. Female healthcare professionals formed the majority of participants (63%). Most participants were not of Saudi nationality (88.9%). The overall average participants' age was 35 years old.

3.2. Main themes

Our study revealed three broad recommended areas to minimize medication errors in the adult oncology department. These themes are discussed here and include organizational support, staff education, and improving communication.

3.2.1. Organizational support

The majority of participants mentioned that organizational support was important in minimizing medication errors. Examples included more supportive policies and leadership for patient safety in general and medication errors in particular.

3.2.1.1. Supportive policies. Participants, most particularly rotating doctors, stated that medication prescriptions policies should be unified in all over the hospital's departments. This would help in avoiding errors in prescriptions and delays in dispensing: *"We should have a prescription policy that is applied similarly in all departments in this hospital to make writing prescriptions safer"* (Medical doctor 2, Focus Group 5). Moreover, the analysis indicated a need to develop a policy that supports free blame and shame culture. In addition, all levels of management should be familiar with it *"All supervisors and heads should have a clear policy from the hospital management to have free blame and shame culture"* (Nurse 4, Focus Group 3).

3.2.1.2. Supportive leadership. Most Participants believed that department leadership could play a key role in minimizing medication errors. From their perspectives, they should be more supportive to non-blame culture as this would improve reporting of errors in this department *"higher authority must create that culture wherein the nurses will not be fear of informing those are medication error so that they can have trained more to the nurses"* (Nurse 2, Focus Group 1). Such a leadership attitude could be further enhanced by more involvement in courses to achieve a more supportive managerial approach to dealing with errors as they occur *"I think we should contact the managers, we need to train the managers how to deal with the healthcare providers who did a medication error"* (Pharmacists 2, Focus Group 7).

3.2.2. Staff education

Participants indicated that providing proper education would help in minimizing medication errors. Education could be improved by the increased use of simulation and training courses.

3.2.2.1. Adoption of simulation. Participants' responses indicated that using simulation as an educational approach would help improve their technical skills in a zero harm environment. This would help them to gain more self-confidence in clinical practice:

"using of stimulation is going to give the healthcare professionals more confidence in all medication administration processes" (Pharmacist 3, Focus Group 7). Moreover, frequent simulation sessions have the potential to improve non-technical skills, particularly communication between team members: *"We can utilize the simulation centre here to have training sessions to improve our communication, and it must be attended from all the healthcare professionals"* (Nurse, Focus Group 2).

3.2.2.2. Frequent training. Participants mentioned that frequent training sessions would help improve their knowledge about common medication errors in the department and ways to avoid the occurrence of such errors: *"we need more educational sessions and discussions about the common medication errors in the department actually. This would help very much if it held every week"* (Medical doctor 2, Focus Group 6). Frequent education sessions would be useful in raising the awareness of newly employed staff and juniors on medication safety-related issues: *"I suggest to do frequent short one or two days intensive course to educate the new staff what kind of chemotherapy since the oncology department is totally different from others in medication preparation."* (Medical doctor 1, Focus Group 6).

3.2.2.3. Improving communication. In this department, communication between healthcare providers could be improved by more frequent meetings, more supportive technology and improved staffing.

3.2.2.4. Frequent meetings. Participants showed concern about the frequency of meetings in the department. They felt the need to have more multi-disciplinary meetings to discuss factors hindering the medication management process: *"We have to make good communication between our staff and our heads of departments by doing periodic meetings inside the department"* (Medical doctor 1, Focus Group 6).

3.2.2.5. Use of technology. Most participants assumed that using electronic prescription systems would help to minimize medication error. They indicated this would improve and facilitate prescribing, save time, and improve communication by producing more legible prescriptions: *"electronic prescription I believe is better, it is really better, it will decrease the workload, wasting time, and the miscommunication between doctors, pharmacists, and nurses"* (Nurse 4, Focus Group 1).

3.2.2.5.1. Improved staffing. The majority of participants believed that staff work overload was a serious barrier to effective communication as they did not have enough time to communicate properly. This overload occurred as a consequence of the shortage of staff compared to the increasing number of admitted patients and limited spaces in the department's facilities: *"The staff are leaving. There is raining going on. The last three years we never saw any recruitment going"* (Medical doctor 1, Focus Group 5). Accordingly, participants proposed that the management should increase staff recruitment of staff of suitable quality to meet the clinical standards. It was accepted that the departmental accommodation was a limitation to increased staffing, requiring the expansion and renovation of the department's facilities.

4. Discussion

To the best of our knowledge, this is the first qualitative study in Saudi Arabia to address strategies to minimize medication errors in an adult oncology department from the perspectives of a variety of healthcare professionals (doctors, pharmacists, and nurses). The findings of this study suggest that improving organizational support, staff education and communication between the staff would

help in minimizing medication errors in the department. Our findings suggest that, of the proposed strategies mentioned above, organizational support for patient safety forms a cornerstone in improving medication safety in the department. In particular, leadership plays a vital role in determining the effectiveness and efficiency of both staff education and communication, both of which would impact positively on the medication process.

The vital role of leadership in promoting safe healthcare practices has been emphasised by many well-recognized healthcare bodies (e.g. The Health Foundation and Agency for Healthcare Research and Quality [AHRQ]) (Leonard and Frankel, 2012; AHRQ, 2018). They highlighted the importance of leadership in establishing high-performing health systems that minimize adverse events (Leonard and Frankel, 2012; AHRQ, 2018). Additionally, healthcare organizations with dedicated leadership would have a culture that encourages learning from errors, supports teamwork, and exploits organizational resources for improving patient safety (Baker, 2011).

However, to achieve this, leadership should demonstrate a commitment to patient safety by engaging themselves in patient safety processes (e.g. leadership safety walk rounds) (Frankel et al., 2003). They should prioritise patient safety during the development of policies and procedures (Scheffler and Zipperer, 1999). Moreover, they should promote openness by adopting a non-punitive approach in managing adverse events, and consider the views of frontline staff members for quality and safety improvement (Elmqvist et al., 2016).

Besides leadership commitment, the provision of appropriate staff education and training, as indicated by participants in this study, have been shown to impact positively on medication safety. For example, Daupin and his colleges (2016) conducted a study to find out whether healthcare professionals are able to identify risks related to medication process by using simulation in a mother and child healthcare setting in Canada. Most participants (97.8%) in this study indicated that adopting simulation as an educational approach was effective in identifying risky practices and that they would change their medication-related practice in light of the simulation results (Daupin et al., 2016).

As mentioned in the above example, the provision of staff training has the potential to improve technical skills related to medication practice. In addition, staff training could have a significant positive impact on the non-technical side of the medication process as well. For example, it was revealed by a study conducted in Blackpool Victoria hospital simulation unit in the UK that simulation session helped in improving participants' non-technical skills (communication and teamwork) with a statistically significant difference between pre- and post-course mean scores (p = 0.0314) (Gordon et al., 2015).

This study had strengths and limitations. In terms of limitations, patients were not involved in this study. Patients have valid points of view which should be considered in research conducted in this context (Schwappach and Wernli, 2010). Moreover, this study was conducted in one department, and therefore the findings cannot be generalizable (Guba and Lincoln, 1994). On the other hand, this study was the first qualitative study to address strategies that could minimize medication errors in an adult oncology department. In addition, we highly considered the multi-disciplinary nature of care in the oncology department; therefore, we included participants from a variety of disciplines who are involved in the medication process.

The findings of this study have a number of implications related to future research, policy-making and practice. This study proposed strategies which would theoretically minimize medication errors in the Saudi oncology setting; therefore, future research should strongly consider interventional approaches to evaluate the effectiveness of the abovementioned strategies in the adult oncology department. With regard to policy making, policies and procedures should be developed for key medication processes and standardized in order to avoid medication-related errors resulting from staff confusion and to reduce discrepancies in medication practices (Irving, 2014). In addition, healthcare managers and leaders have to maintain staff competency through the provision of continuous training and education (Gesme et al., 2010). They must also promote openness in the workplace to encourage staff to raise patient safety issues and learn from errors (Campione and Famolaro, 2018).

5. Conclusion

The adoption of multiple strategies is required to improve the safety of the medication process in the adult oncology department. Those strategies should address organizational support, training and education, as well as communication between staff. We argue that the availability of supportive leadership should be prioritized as it plays a crucial role in determining the effectiveness and efficiency of both staff education and communication, both of which would impact positively on the safety of the medication process.

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