Rate, causes and reporting of medication errors in Jordan: nurses’ perspectives

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Introduction

Medication errors are any preventable events that may cause or lead to inappropriate use of medications or patient’s harm while the medication is in the control of health care professionals, patients or consumers (Institute of Medicine IOM 1999, Kohn et al. 2000).

Patient safety, in the current health care arena, is an important indicator of health care quality, and in turn the survival of any health care institution (Benjamin 2003). Ten to 18% of all reported hospital injuries are attributed to medication errors (Hume 1999, Stetler et al. 2000).

Medication errors result from many causes; these include but are not limited to poor hand writing, inadequate documentation and the nursing shortage (Board of Nurse Examiners 2001, Fontan et al. 2003). Medication errors influence patients, nurses and organizations negatively. Thus, this issue requires immediate attention of all members of the health care team.

Worldwide in general and in the developing countries in particular, medication errors are under-reported (Kapborg & Svennson 1999, Osborne et al. 1999), which may indicate deficiencies in the health care system (Moore 1998, Hume 1999, Anderson 2003).

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Aim The aim of the study was to describe Jordanian nurses’ perceptions about various issues related to medication errors.

Background This is the first nursing study about medication errors in Jordan.

Methods This was a descriptive study. A convenient sample of 799 nurses from 24 hospitals was obtained. Descriptive and inferential statistics were used for data analysis.

Results Over the course of their nursing career, the average number of recalled committed medication errors per nurse was 2.2. Using incident reports, the rate of medication errors reported to nurse managers was 42.1%. Medication errors occurred mainly when medication labels/packaging were of poor quality or damaged. Nurses failed to report medication errors because they were afraid that they might be subjected to disciplinary actions or even lose their jobs. In the stepwise regression model, gender was the only predictor of medication errors in Jordan.

Conclusions Strategies to reduce or eliminate medication errors are required.

Key words: medication errors, nursing, rate, reporting, Jordan

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Medication errors are caused by many health care professionals, such as physicians, pharmacists; however, nurses are usually placed on the frontline when medication errors occur. Nurses play a key role in the process of medication administration, and therefore should be active in the prevention of medication errors (Aiken et al. 2002, Benjamin 2003). However, to enhance nurses’ involvement in preventing medication errors, health care systems require redesign rather than perpetuating the current traditional systems in which individuals are punished for committing medication errors. Such punitive actions are more prevalent in developing countries (Board of Nurse Examiners 2001).

For the purpose of this study, recalled committed medication errors were defined as the number of medication errors which nurses remembered that they did over the course of their career. The rate of medication errors was estimated by calculating the average of the reported rates of medication errors to nurse managers via incident reports.

Purpose and significance of the study

‘Medication errors’ is a global health care issue. It is crucial to control medication errors because these errors are very costly (Brown 2001, Ovretveit & Sachs 2005). Moreover, it is well known that medication errors adversely influence patients’ safety, which is a priority in today’s nursing practice (Pronovost et al. 2005).

Many studies addressed medication errors; however, few studies explored the relationships between medication errors and nurses’ characteristics as well as the predictors of medication errors (Osborne et al. 1999, Blegen et al. 2001). In Jordan, there were no published nursing studies about medication errors.

Jordan is a developing country that suffers from scarcity of resources, including shortage of nursing professionals which resulted in an increased workload, and in turn an increased risk of committing medication errors. In Jordan and in many other countries, controlling medication errors would decrease the health care expenditure.

In Jordan, physicians are responsible for prescribing medications, pharmacists are responsible for dispensing and storing medications and nurses are responsible for administering medications. Thus, the prevention of medication errors requires collaboration among all members of the health care team; however, when it comes to medication errors, physicians’ decisions and behaviours related to patient care are not questioned in contrast to nurses’ decisions and behaviours. As a result, nurses are frequently blamed when medication errors occur.

This study investigated nurses’ recalled committed medication errors, and the rate of medication errors reported to the nurse managers using incident reports. In addition, this paper aimed at identifying causes of medication errors and nurses’ views on reporting these errors.

Research Questions

The researchers of the current study answered the following research questions:

- What is the number of recalled committed medication errors per nurse over the course of his/her nursing career?
- What is the rate of medication errors reported to nurse managers using incident reports?
- What are the causes of medication errors, as perceived by nurses?
- What are nurses’ views about reporting medication errors?
- What are the relationships between the number of reported medication errors and selected sample’s characteristics?
- What are the predictors of medication errors?

Literature Review

Medication errors are defined as deviations from a physician’s order (Mayo & Duncan 2004). ‘Medication errors’ is a global issue that causes serious harm and even death. ‘Medication errors’ is one of the five types of medical errors classified by the IOM.

The rate of medication errors per patient per day is estimated to be 1.9 (Fontan et al. 2003). The consequences of medication errors are serious. About 5% of all medication errors are deadly, and almost 50% of these errors are preventable (Thomas et al. 2001). The consequences of medication errors include disability, death, physical and psychological harm and prolonged length of stay (Osborne et al. 1999, Kozer et al. 2004, Mayo & Duncan 2004).

Medication errors are caused by poorly written orders, calculation errors, administration errors, inadequate documentation, lack of sufficient knowledge about patients, the nursing shortage and failure of devices such as infusion pumps (Board of Nurse Examiners 2001, Fontan et al. 2003).
Medication errors in the developing countries

It is difficult to get the total picture of medication errors in developing countries. This difficult situation is related to the limited number of research studies on this subject. In a longitudinal study from 1997 to 2002, two reviewers using a structured process evaluated reports of an operating theatre in a teaching hospital in Pakistan. Khan and Hoda (2005) reported that 21% critical incidents were related to medication errors. The errors were most common under dosage and side-effects of medications. Almost, 76% of medication errors were classified as preventable; 56% because of human errors and 19% because of system errors.

In Kuwait, 19% of children admitted to a paediatric teaching hospital received either therapeutic or prophylactic antibiotics. The indications of admissions included respiratory infections, urinary infections, septicemia, meningitis, gastroenteritis, other infections and prophylaxis in rheumatic fever or splenectomy. The use of antibiotic was assessed as unnecessary in 282 children, of whom 203 (72%) had respiratory infections. The majority of mistakes related to the use of antibiotics were encountered while administering penicillin (Najdi et al. 1988). In Yemen, in terms of the total expenses, the top-ranked medication was injectable lincomycin (Laing et al. 2001). In Indonesia, injectable tetracycline was responsible for the second highest medication expense (Laing et al. 2001).

Medication errors: physicians, pharmacists and nurses

‘Medication errors’ is not the sole territory of a particular health professional. Physicians, pharmacists and nurses are prone to commit medication errors. In a written survey among 34 physicians in the UK, more than half of the physicians gave incorrect answers when questioned about the appropriate dose of adrenaline for a systole in a child (Kozer et al. 2004). Prospectively, in the UK, pharmacists at a teaching hospital identified 88 potentially serious prescribing errors. The researchers suggested that most mistakes were made because of a lack of attention, or because prescribers did not apply relevant rules. Physicians identified many risk factors that increased the rates of committing medication errors. These factors include workload, problem of communication within the health care team, physical and mental problems, whether or not they were prescribing for their own patients, and lack of knowledge about medications. Organizational factors increase the risk of committing medication errors, these include inadequate training, absence of self-awareness of errors and low perceived importance of prescribing medications (Dean et al. 2002).

At pharmacies of two community governmental hospitals in Jordan, physicians commonly prescribed non-steroidal anti-inflammatory drugs (NSAIDs), particularly diclofenac (69%). Patients’ awareness about the proper use of NSAIDs was poor, and the pharmacists’ roles in patients’ education were inadequate (Albsoul-Younes et al. 2004).

Although all health care providers are prone to commit medication errors, nurses are placed at the frontline when it comes to administering medications (Wolf 1989, Aiken et al. 2002, Benner et al. 2002, Benjamin 2003, Fontan et al. 2003, National Academy of Sciences 2003). In the UK, as in most other countries, nurses generally prepare and administer intravenous medications prescribed by doctors. Administration of intravenous therapy is associated with considerable risks (Taxis & Barber 2003). As they are in the frontline, committing medication errors may negatively influence nurses. That is, the psychological trauma can be overwhelming to nurses because of worries about their patients and jobs. Nurses may feel angry at themselves and the settings where they work (Morris 1991, Gladstone 1995).

Contributing factors of medication errors

Medication errors may occur in any phase of medication process (Osborne et al. 1999). Medication errors indicate the presence of problems related to health care systems rather than problems related to individuals (O’Shea 1999). Systems, not individuals, are more often at fault for medication errors (Booth 1994).

Fontan et al. (2003) identified various sources of medication errors, these include poorly written orders, dispensing errors, calculation errors and administration errors. Factors contributing to medication errors can be categorized into systems used in ordering and storage of medicines that may include the use of time-expired medications; information/communication areas associated with problems related to medication administration such as inadequate or altered labelling, confusion with names of medicines and inadequate documentation; areas of concern which involve direct interaction with patients include calculation errors, and/or a lack of sufficient knowledge about patients; the nursing shortage and workload, that is nursing staffing levels significantly influence patients’ mortality rates; and general factors that increase rates of medication errors including misuses of infusion pumps and failure to explain reasons for errors.
Paediatric population could be more prone to medication errors. In a recent study, 10% of children treated in the emergency department were subjected to medication errors. The risk of errors was greater when a medication was ordered by a trainee and in patients with severe rather than mild diseases (Kozer et al. 2004). The researchers reported that dosing errors in children are the most common type of errors.

**Reporting medication errors**

Reporting medication errors is one of the major issues in today’s health care environments. Preventing medication errors is linked to the accurate reporting of these errors (Mayo & Duncan 2004). Many studies revealed the under-reporting of medication errors among nurses (Gladstone 1995, Wakefield et al. 1996, 2001, Kapborg & Svennson 1999, Osborne et al. 1999, Blegen et al. 2001). Nurses believed that only 25% of all medication errors were reported using incident reports. Only 3.5% of nurses believed that all medication errors were ever reported (Osborne et al. 1999). Under-reporting of medication errors may point out defects of the health care system (Hume 1999, Anderson 2003). For example, in organizations that usually rely on incident reports to report medication errors, Moore (1998) claimed that these reports might be missing up to 95% of the data.

There are many reasons for not reporting or the under-reporting of medication errors. Disagreement over the definition of an error is a major cause of not reporting or under-reporting of medication errors (Wakefield et al. 1996). That is, nurses and other professionals are inconsistent in their perspectives of what constitutes a medication error. Almost, 16% of nurses were unsure what situation constituted a medication error and 14% were unsure when to report an error (Osborne et al. 1999). Ninety-five percent of medication errors were not reported because of staff’s fear of punishment (Hume 1999, Kapborg & Svennson 1999, Osborne et al. 1999). Nurses commonly report errors resulting in overmedication (Kapborg & Svennson 1999). Nurse managers themselves reported that they are concerned about the reputation of their organizations, thus they may not report medication errors (Kapborg & Svennson 1999, Dunn 2003). To get the complete picture of medication errors committed by health care professionals, self-reports are needed.

**Methodology**

In the current study, various issues of medication errors were explored. This descriptive correlational study was conducted during the fall of 2005 using a self-report survey. The current study was a replication of studies conducted by Osborne et al. (1999) and Mayo and Duncan (2004). A convenient sample of 799 Jordanian nurses was recruited from governmental teaching hospitals, 11 government and 11 private hospitals in Jordan. At each hospital, nurses were identified through the nursing office. The sampling criterion was ‘nurses have to work at hospital settings for a minimum period of 6 months’. This criterion was set to guarantee that nurses are involved in administering medications.

**Instrument**

The Modified Gladstone’s scale was used to collect data on rate, causes and reporting of medication errors (Osborne et al. 1999, Mayo & Duncan 2004). This instrument measures: (1) rate of medication errors reported to nurse managers (one item); (2) nurses’ perceived causes of medication errors (10 items); and (3) nurses’ views about reporting medication errors (six items).

A pilot study was conducted to assess the appropriateness and comprehensiveness of the research instrument to the Jordanian health care setting. Revisions were made before collecting the data, particularly eliminating the case scenarios that were included in the original instrument. The psychometric measures of the instrument were determined by previous investigators (Gladstone 1995, Osborne et al. 1999, Mayo & Duncan 2004).

A demographic form was developed by the current investigators and used to identify the following sample’s characteristics: gender, age, level of education, length of period of administering medications, years of experience in nursing, numbers, of medication errors over the course of one’s career, time commitment, shift worked, area of work and type of hospitals.

**Data collection and ethical consideration**

The first step in conducting this study was obtaining the approval of the university where the researchers are currently working, and from the administrators of participating hospitals. All nurses in the selected hospitals were sent a letter to invite them to participate in the study. Data were collected using the English-version of the instrument as English is the official language of education at all nursing schools.

All questionnaires were numerically coded before being sent to the subjects. Nurses’ anonymity and confidentiality of participants’ information were
assured. All questionnaires were handled by the research team only.

**Data analysis**

Data were analysed using SPSS version 11.5 (SPSS Inc. 2001) at an alpha level of 0.05. Descriptive statistics were generated for all variables.

In this study, sample’s characteristics were treated as categorical variables. As rated by nurses, causes of medication errors, and views about reporting of medication errors were ranked in descending order, thus they were treated as ordinal variables (Agresti & Finlay 1999). A total score for medication errors was calculated by adding the items of the scale and dividing them by the number of these items; total scores will decrease type I error (Agresti & Finlay 1999).

Over the course of the nursing career, the number of recalled committed medication errors per nurse was determined by calculating an average of all recalled committed medication errors. To determine the rate of medication errors reported to nurse managers using incident reports, an average of all reported rates was calculated.

Of a secondary focus, based on the total scores of medication errors, different types of hospitals and areas of work were compared using chi-squared tests. To identify causes of medication errors, nurses were given a list of 10 causes of medication errors. Nurses were asked to rate each cause on a scale ranged from 1 to 10 with 1 indicating least frequent cause and 10 indicating most frequent cause. To assess nurses’ views about reporting medication errors, nurses’ reported means were ranked in descending order. To determine the relationships between the total score of medication errors and sample’s characteristics, correlations were calculated. To determine predictors of medication errors, a stepwise regression analysis was performed. Because the researchers had no prior idea about which variables carried the highest weight in explaining the variation in medication errors, the dependent variable (total score of medication errors) was regressed on the independent variables (sample’s characteristics) (Polit & Beck 2004).

**Results**

**Participants**

Of the 1400 possible respondents of Registered Nurses (RNs), 799 responded to the survey, representing a 57% response rate. The percentage of male nurses (54%) was slightly higher than the percentage of female nurses (46%). The mean age of the respondent RNs was 29.5 years. It is important to mention that the majority of non-respondent nurses were also young; they were the possible respondents who did not meet the sampling inclusion criterion. About 74% of the participants hold a bachelor degree in nursing, had been qualified to administer medications 1–4 years (52.5%), had 1–4 years of experience in nursing (48.3%), worked on full-time basis (75.1%) on rotating shifts (68.8%), at critical care units (58.0%) of teaching hospitals (49.3%). As a part of the demographic survey, RNs were also asked about the number of medication errors they could remember that they made over the course of their career. The mean of recalled committed errors was 2.2 per nurse (Table 1). Over the course of their nursing career, nurses reported that 42.1% of all committed medication errors were reported to nurse managers using incident reports (Table 2).

Although it is not the main focus of the current study, the overall mean of medication errors in the whole sample was 5.74; 5.70 in teaching hospitals, 5.74 in governmental hospitals and 5.83 in private hospitals. There were no significant differences between different types of hospitals with regard to the total score of medication errors ($\chi^2 = 312.27, P = 0.198$). Based on the total score of medication errors, comparisons were also made between general wards and critical care units, there were no significant differences as well ($\chi^2 = 167.00, P = 0.113$).

The highest three perceived causes of medication errors were medication errors occur when the medication labels/packaging were of poor quality or damaged ($\bar{X} = 5.71, SD = 3.09$); medication errors occur when nurses were confused by the different types and functions of infusion devices ($\bar{X} = 5.61, SD = 2.87$); and medication errors occur when nurses were distracted by other patients, coworkers or events on the unit ($\bar{X} = 5.42, SD = 2.91$) (Table 3).

In term of nurses’ views about reporting medication errors, the most frequent reasons related to nurses’ failure to report medication errors were because nurses were afraid that they might be subjected to disciplinary actions or even lose their jobs ($\bar{X} = 1.59, SD = 0.491$); did not think the errors were serious to warrant reporting ($\bar{X} = 1.58, SD = 0.492$); were afraid of the reaction they will receive from their coworkers ($\bar{X} = 1.40, SD = 0.490$); and were afraid of the reaction they will receive from their nurse managers ($\bar{X} = 1.34, SD = 0.476$) (Table 4).

To assess the relationships between the total score of medication errors and sample’s characteristics,
correlations were calculated; however, none of these correlations were significant (Table 5). To determine the predictors of medication errors, stepwise regression analyses were performed between the total score of medication errors and sample's characteristics. Gender was the only predictor ($r = 0.087$, $r^2 = 0.008$, adjusted $r^2 = 0.006$, $r^2$ change $= 0.008$, $F = 5.54$, $P = 0.019$) with female nurses reporting a higher number of medication errors than the male nurses.

### Discussion

Jordanian nurses’ perceptions about various issues of medication errors were explored in the current study. Because of convenience sampling technique, findings may not be generalizable. Causes of medication errors were limited because the current researchers deleted the scenarios of medication errors that were listed in the original instrument. Patients’ variables such as age and complexity of diseases were not studied, so the complete picture of medication errors in Jordan is not clear. Small and accidental errors were not studied in the current research.

While Mayo and Duncan (2004) reported that medication errors occur because physician’s handwriting is difficult to read and that nurses are distracted and exhausted, nurses in the current study reported that medication errors occur when the medication labels/packaging are of poor quality or damaged; this result is consistent with Conroy and McIntyre (2005) and Osborne et al. (1999). Medication errors occur when nurses are confused by the different types and functions of infusion devices; this result is also consistent with the studies of Giannone (2005) and Hussain and Kao (2005). Medication errors happen when nurses are distracted by other patients, coworkers or events on the unit; this result is congruent with Mayo and Duncan (2004). Causes of medication errors were different; this

### Table 1

Sample’s characteristics ($n = 799$)

<table>
<thead>
<tr>
<th>Variables</th>
<th>n*</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>408</td>
<td>54.0</td>
</tr>
<tr>
<td>Female</td>
<td>348</td>
<td>46.0</td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than 25 years</td>
<td>386</td>
<td>48.5</td>
</tr>
<tr>
<td>25–34 years</td>
<td>311</td>
<td>39.1</td>
</tr>
<tr>
<td>35–44 years</td>
<td>86</td>
<td>10.8</td>
</tr>
<tr>
<td>45–54 years and above</td>
<td>13</td>
<td>1.6</td>
</tr>
<tr>
<td>Level of education</td>
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<td></td>
</tr>
<tr>
<td>Diploma</td>
<td>170</td>
<td>21.3</td>
</tr>
<tr>
<td>Baccalaureate</td>
<td>592</td>
<td>74.3</td>
</tr>
<tr>
<td>Master and above</td>
<td>35</td>
<td>4.4</td>
</tr>
<tr>
<td>Length of period of administering medications</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6–12 months</td>
<td>188</td>
<td>23.6</td>
</tr>
<tr>
<td>1–2 years</td>
<td>227</td>
<td>28.6</td>
</tr>
<tr>
<td>3–4 years</td>
<td>190</td>
<td>23.9</td>
</tr>
<tr>
<td>5–9 years</td>
<td>105</td>
<td>13.2</td>
</tr>
<tr>
<td>10 years or more</td>
<td>85</td>
<td>10.7</td>
</tr>
<tr>
<td>Years of experience in nursing</td>
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<td></td>
</tr>
<tr>
<td>6–12 months</td>
<td>198</td>
<td>25.0</td>
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<tr>
<td>1–2 years</td>
<td>206</td>
<td>26.0</td>
</tr>
<tr>
<td>3–4 years</td>
<td>177</td>
<td>22.3</td>
</tr>
<tr>
<td>5–9 years</td>
<td>122</td>
<td>15.4</td>
</tr>
<tr>
<td>10 years or more</td>
<td>90</td>
<td>11.3</td>
</tr>
<tr>
<td>Time commitment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Full-time</td>
<td>593</td>
<td>75.1</td>
</tr>
<tr>
<td>Part-time</td>
<td>197</td>
<td>24.9</td>
</tr>
<tr>
<td>Shift worked</td>
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<td></td>
</tr>
<tr>
<td>Day</td>
<td>183</td>
<td>23.1</td>
</tr>
<tr>
<td>Evening</td>
<td>33</td>
<td>4.2</td>
</tr>
<tr>
<td>Night</td>
<td>31</td>
<td>3.9</td>
</tr>
<tr>
<td>Rotating</td>
<td>546</td>
<td>68.8</td>
</tr>
<tr>
<td>Area of work</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Critical care units</td>
<td>458</td>
<td>58.0</td>
</tr>
<tr>
<td>Wards</td>
<td>332</td>
<td>42.0</td>
</tr>
<tr>
<td>Type of hospitals</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Teaching</td>
<td>394</td>
<td>49.3</td>
</tr>
<tr>
<td>Governmental</td>
<td>174</td>
<td>21.8</td>
</tr>
<tr>
<td>Private</td>
<td>231</td>
<td>28.9</td>
</tr>
<tr>
<td>Number of medication errors over the course of nursing career</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>172</td>
<td>22.1</td>
</tr>
<tr>
<td>1</td>
<td>153</td>
<td>19.6</td>
</tr>
<tr>
<td>2</td>
<td>174</td>
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<td>3</td>
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<td>10</td>
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<td>0.8</td>
</tr>
<tr>
<td>779</td>
<td></td>
<td>2.2</td>
</tr>
</tbody>
</table>

*Some total values did not sum up to 799 because of missing values.

### Table 2

Recalled committed medication errors reported to the nurse managers by incident reports

<table>
<thead>
<tr>
<th>Rate of reported medication errors</th>
<th>n*</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 (never committed a medication error)</td>
<td>2</td>
<td>0.02</td>
</tr>
<tr>
<td>1–10</td>
<td>107</td>
<td>15.4</td>
</tr>
<tr>
<td>11–20</td>
<td>75</td>
<td>10.8</td>
</tr>
<tr>
<td>21–30</td>
<td>100</td>
<td>14.4</td>
</tr>
<tr>
<td>31–40</td>
<td>91</td>
<td>13.2</td>
</tr>
<tr>
<td>41–50</td>
<td>109</td>
<td>15.7</td>
</tr>
<tr>
<td>51–60</td>
<td>53</td>
<td>7.7</td>
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<tr>
<td>61–70</td>
<td>62</td>
<td>8.9</td>
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<tr>
<td>71–80</td>
<td>45</td>
<td>6.5</td>
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<tr>
<td>81–90</td>
<td>40</td>
<td>5.7</td>
</tr>
<tr>
<td>91–100</td>
<td>12</td>
<td>1.7</td>
</tr>
</tbody>
</table>

Total N* = 696 Overall average = 42.1%

*Some data were missed.
could be attributed to differences in health care systems in general, and to differences in clinical settings in particular.

Using incident reports, only 42.1% of medication errors were reported to nurse managers. Such a rate demonstrates that medication errors were under-reported by nurses. In addition, the average of nurses’ self-reporting of committed medication errors was two, which is much lower than the 4.9 medication errors reported by Mayo and Duncan (2004). While carefully considering the differences in the health care settings and the methodology of each study, the rate of medication errors reported to nurse managers in the current study was 42.1% when compared with 45.6% in the study of Southern California (Mayo & Duncan 2004), and to 25% at Osborne’s et al. (1999) study. It is clear that the rate of medication error is reported to increase over the years. Also, these figures pinpoint that medication errors in Jordan is a serious issue that requires an immediate attention.

Unlike the American nurses (Mayo & Duncan 2004), Jordanian nurses did not exactly know when to report an error using an incident report, and they were not sure about what constitutes medication errors. These
differences could be related to the disagreement over the definition of medication errors (Wakefield et al. 1996, Osborne et al. 1999, Mayo & Duncan 2004).

However, similar to the American nurses, Jordanian nurses reported that reasons of not reporting medication errors included that nurses did not think that an error was serious enough (Osborne et al. 1999, Mayo & Duncan 2004), and they were afraid of coworkers’ reactions (Osborne et al. 1999, Mayo & Duncan 2004). More than the American nurses, Jordanian nurses failed to report medication errors because they were afraid that they might be subjected to disciplinary actions or even lose their jobs (Gladstone 1995, Osborne et al. 1999, Mayo & Duncan 2004). On the other hand, the American nurses were not reporting medication errors because they were afraid of their nurse managers’ reactions.

In the current study, gender of the nurse was the only predictor of medication errors; female nurses tend to recall committing more medication errors than do male nurses. In the current research, correlations did not indicate any significant relationships between the total score of medication errors and sample’s characteristics, which is consistent with other studies. In the literature, age and years of practice were not correlated with medication errors (Osborne et al. 1999, Anderson 2003, Mayo & Duncan 2004). This suggests that there is no single sample’s characteristics that strongly associate with causes of medication errors or their reporting. Thus, relationships between sample’s characteristics and medication errors should be studied in depth in future research studies. Finally, nurses in all organizations require assistance in identifying what constitutes a medication error, and how and to whom to report such errors.

### Strategies for preventing medication errors

Eliminating or decreasing of medication errors is an urgent issue for the majority of health care organizations. Nurses’ education regarding medication safety can be one of the preventive strategies. This simply could be done by the application of patient’s five rights of medication administration. Also, nurses have to know the side-effects of medications they administer to their patients. Along with nurses’ education, patients should be educated about their courses of treatments. Patients’ education is a crucial step to start with to prevent or decrease medication errors (Marino et al. 2000, Mayo & Duncan 2004, Liang et al. 2001).

Health care institutions have to establish comprehensive, accurate and timely reporting policies based on
up-to-date knowledge, and at the same time recognizing the defects of health care systems (Gladstone 1995, Osborne et al. 1999, Mayo & Duncan 2004). Medication packages or infusion devices should be checked for any damage before they are used. Moreover, clear labels should be placed in all medication packages.

Health care organizations must have a clear definition of medication errors, and should take all necessary measures to educate health care members. From a risk management perspective, medication errors and all other medical errors should be reported so that organizations can improve patients’ safety programmes (Anderson 2003, Dennison 2005, Donn 2005, Hughes & Ortiz 2005, Pronovost et al. 2005). Yet, to achieve the full benefits of risk management, adequate staff should be hired and retained; Jordanian nurses reported distraction by patients and coworkers as the third cause of medication errors.

It is important to mention that there could be other predictors of medication errors other than those appeared in the stepwise regression model and correlation matrix. At the beginning of their careers, the researchers of the current study worked as nurses in one of the teaching hospitals where the current study was conducted. The current researchers observed that the nursing shortage in Jordan was a problematic issue that influenced patient safety. Therefore, the nursing shortage may be recognized as a significant factor that influences medication errors in Jordan. Because nurses are required to work with a large number of patients who have different health conditions and severity of diseases, nurses are more prone to commit medication errors under such stressful events. Also, nurses’ limited autonomy over patient care is another important factor that may play a role in committing medication errors. Because physicians’ orders are highly prioritized in Jordan, some nurses may not question physicians’ medication orders, thus nurses may commit more medication errors, which may put the patients’ lives in danger.

Medication errors are a system-related problem and must be viewed as such (Anderson 2003). Systems-oriented thinking should be promoted to enhance nurses’ judgment to decrease or prevent medication errors. Thus, supportive and non-punitive working environments are needed to encourage the reporting of medication errors. Irrespective of the type of hospital or the area of work, creating an organizational culture of medication safety is a milestone to eliminate or decrease medication errors. In this regard, educational programmes should be integrated into the nursing curriculum at the undergraduate and graduate levels. The results of this study may contribute to redesigning health care systems to reduce or eliminate barriers to reporting medication errors.

Recommendations

A convenience sampling technique was used in this study, thus the findings may not be generalizable. As ‘medication errors’ is a multifaceted practice issue, the research instrument should be expanded to include a wider range of causes. Follow-up studies are needed to explore the concept of medication errors indepth. Rather than focusing on the overall picture of medication errors, specific categories of medications have to be explored in future research. Comparative studies using the individual items of medication errors scale should be carried out to assess rates and causes as well as the reporting patterns of medication errors across different types of hospitals and clinical settings. In Jordan, in teaching hospitals, there are clear policies to manage medication errors and their reporting. Patients’ variables such as age and chronicity of diseases have to be explored in future research studies. Finally, trivial medication errors such as giving vitamins late were not studied. Thus, non-prescription medication errors should be included in future studies; minor errors underlay the major ones.

Summary and conclusions

The purpose of this research was to explore Jordanian nurses’ perceptions about medication errors and their related issues. It was reported that only 42.1% of medication errors were reported to nurse managers using incident reports; indicating under-reporting of medication errors by nurses. The rate of medication errors reported is increasing over the years, which requires immediate interventions. Strategies to reduce or eliminate medication errors are mandated.

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References


Nurses’ Perceptions of Medication Errors

As you know, there is an increased attention to medication errors. The researchers ask you to help them by filling out the survey that will take about 15 min of your time. Taking part in this project is entirely up to you, and even if you begin the survey, you may stop at any time. We ask no identifying personal data. If you have questions about the study, please contact us: Dr Majd Mrayyan at mmrayyan@hu.edu.jo, Dr Ibrahim Al-Faouri at faouri64@yahoo.com or Dr Kawkab Shoshani at kawkab@hu.edu.jo, Faculty of Nursing, The Hashemite University.

Thanks for your participation.

Nurses’ perceptions of medication errors: Modified Gladstone 2001

Why Do You Think Medication Errors Occur?

1. The following 10 statements are all possible causes of medication errors. Please read them carefully and Rank #1 to #10. (#1 is the most frequent and #10 the least frequent)

a. Drug errors occur when the nurse fails to check the patient’s name band with the Medication Administration Record (MAR). _______

b. Drug errors occur when the physician’s writing on the doctor’s order form is difficult to read or illegible. _______

c. Drug errors occur when the medication labels/packaging are of poor quality or damaged. _______

d. Drug errors occur when there is confusion between two drugs with similar names. _______

e. Drug errors occur when the physician prescribes the wrong dose. _______

f. Drug errors occur when the nurse miscalculates the dose. _______

g. Drug errors occur when the nurse sets up or adjusts an infusion device incorrectly. _______

h. Drug errors occur when nurses are confused by the different types and functions of infusion devices. _______

i. Drug errors occur when nurses are distracted by other patients, coworkers or events on the unit. _______

j. Drug errors occur when nurses are tired and exhausted. _______

2. In your estimation, what percentages of all committed drug errors are reported to the Nurse Manager by the completion of an incident report? (Please make an X on the line that corresponds most closely to your estimation.)

1% ________________________________100%

3. What are your views about reporting medication errors?

Please check the most appropriate response:

a. I am usually sure what constitutes a medication error ______ Yes ______ No

b. I am usually sure when a medication error should be reported using an incident report ______ Yes ______ No

c. Some medication errors are not reported because nurses are afraid of the reaction they will receive from the Nurse Manager. ______ Yes ______ No

d. Some medication errors are not reported because nurses are afraid of the reaction they will receive from their coworkers. ______ Yes ______ No

e. Have you ever failed to report a drug error because you did not think the error was serious to warrant reporting? ______ Yes ______ No

f. Have you ever failed to report a medication error because you were afraid that you might be subject to disciplinary action or even lose your job? ______ Yes ______ No

Please fill in the answers below.

1. Gender: 1-Male 2-Female

2. Age:

1. Less than 25 years
2. 25–34 years
3. 35–44 years
4. 45–54 years
5. 55 years or more

3. Check highest level of education:

1. Diploma
2. Baccalaureate
3. Master
4. Doctorate

4. How long have you been qualified to administer medications?
1. Less than one year
2. 1–2 years
3. 3–4 years
4. 5–9 years
5. 10 years or more

5. How long have you been a practicing nurse?
   1. Less than one year
   2. 1–2 years
   3. 3–4 years
   4. 5–9 years
   5. 10 years or more

6. How many medication errors do you remember making over the course of your career? (Circle the correct answer.)
   0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, more than ten, please specify _______.

7. What is your work commitment?
   1. Full-time
   2. Part-time

8. Which shift do you work?
   1. Day (12 hours)
   2. Evening (12 hours)

9. What is your primary hospital work setting?
   1. ICU
   2. CCU
   3. Cardiac Unit-Open Heart Surgery
   4. Neuro-ICU
   5. Neonatal-ICU
   6. Pediatrics-ICU
   7. Burn Unit
   8. Emergency Room
   9. Recovery Room
   10. Cardiac Catheterization Lab.
   11. General Medical Ward
   12. General Surgical Ward
   13. Obstetric Ward
   14. Pediatric Ward
   15. Psychiatric Ward
   16. Operating Room
   17. Other: (Please describe): ___________

Thank You!