

Medication Error Reporting Rate and its Barriers and Facilitators among Nurses

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ABSTRACT

Introduction: Medication errors are among the most prevalent medical errors leading to morbidity and mortality. Effective prevention of this type of errors depends on the presence of a well-organized reporting system. The purpose of this study was to explore medication error reporting rate and its barriers and facilitators among nurses in teaching hospitals of Urmia University of Medical Sciences (Iran). **Methods:** In a descriptive study in 2011, 733 nurses working in Urmia teaching hospitals were included. Data was collected using a questionnaire based on Haddon matrix. The questionnaire consisted of three items about medication error reporting rate, eight items on barriers of reporting, and seven items on facilitators of reporting. The collected data was analyzed by descriptive statistics in SPSS₁₄. **Results:** The rate of reporting medication errors among nurses was far less than medication errors they had made. Nurses perceived that the most important barriers of reporting medication errors were blaming individuals instead of the system, consequences of reporting errors, and fear of reprimand and punishment. Some facilitating factors were also determined. **Conclusion:** Overall, the rate of medication errors was found to be much more than what had been reported by nurses. Therefore, it is suggested to train nurses and hospital administrators on facilitators and barriers of error reporting in order to enhance patient safety.

Introduction

Medical mistakes occur as a result of human fallibility compounded by poor healthcare system design that allows for error.¹ These mistakes occur when healthcare professionals do the right things in a wrong way.² Nursing mistakes, such as medication errors and mistakes during caring, are prevalent everywhere. Nursing mistakes are important because they may result in irreversible consequences. Nursing error is an operational expression which happens because a planned chain of physical and mental actions fail to reach the goal (in treatment, health promotion, etc) and this failure cannot be attributed to the intervention of the chance.³ This type of errors results high morbidity and

mortality, in addition to large sums of treatment costs annually.⁴

Medication errors are among the most prevalent medical errors leading to morbidity and mortality worldwide. According to the Institute of Medicine, medication errors are among the 5 categories of medical errors.^{5,6} Medication administration is one of the most important duties of nurses. It requires a particular set of knowledge and attitude if it is to be implemented correctly. Medication errors can put nursing practice at risk and can create preventable risk for patients.⁷ Nurses hold responsibility for taking care of patients and providing safety for them. Therefore, medication administration and preventing medication errors impose more obligation on them.⁷ It could be concluded

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that, in working with and for patients, risk for patients is a serious, permanent and unavoidable part of the practice.⁸ European studies have shown that 19-28% of hospitalized patients encounter medication errors.⁹ An estimated number of 48,000-98,000 patients die from medical errors each year in the United States of America.¹⁰ About 7,000 people per year are estimated to die from medication errors¹¹ while 50% of such errors are preventable.¹²

There is no comprehensive reliable source of information and statistics on medical errors in Iran. Nevertheless, according to the Ministry of Health and Medical Education, annual costs of prolonged hospitalization and extra care due to medication errors exceed billions of Tomans in Iran. An increase in the number of medical error-related cases opened against physicians can be considered as a sign of this issue.¹³ One of the few studies conducted on medication errors showed that medication errors occurred 19.5% per individual nurse in 3 months.¹⁴ Another study concluded that the prevalence of medication errors in nursing staff was 16.7%.¹⁵

Reporting errors is fundamental to error prevention. Reporting reduces the adverse effects of errors and effectively helps to avoid future errors that can cause patient harm. In addition, reporting reduces the number of future errors and thus diminish personal suffering and decrease financial costs.¹⁶ However, a low percent of medication errors are actually reported.^{3,17} Jolayi et al. were concerned about barriers to medication error reporting and emphasized the importance of reporting errors.¹⁴

Since reporting medication errors is fundamental to patient safety, identifying the facilitators and barriers to reporting errors would be an important topic for any investigation of patient safety. On the other hand, there are not adequate comprehensive studies on this issue. Therefore, this study aimed to investigate the rate, facilitators, and barriers of medication error reporting in Iranian nurses. We hope that our findings will

be beneficial in recommending steps to control and prevent preventable medication errors.

Materials and methods

This descriptive study was conducted in Urmia University teaching hospitals in 2011. The study population included all nursing staff working in Urmia University teaching hospitals who were directly involved in medication administration. The exclusion criterion was unwillingness to participate in the study. For determining the sample size, a pilot study was conducted. Using proportional stratified random sampling, 107 nursing staff members were selected for the pilot study. Considering 95% confidence interval for the mean (2.61-2.70) in medication error section, the number of participants was calculated as 800.

After obtaining the required permissions and ethical approval, the nurses were explained about the aims of the study, confidentiality of information, and their right to withdraw at any time. Although 800 nurses were included in the study, 736 nurses accepted to participate and provided informed consents and the participants were asked to complete a questionnaire. Three questionnaires contained inadequate information and were thus excluded from the study. Consequently, 733 questionnaires were analyzed.

Data was collected by a questionnaire based on Haddon matrix. The questionnaire consists of two parts. The first part collects the demographic and social information of the nurses. The second part gathers medication error rate (three items), barriers to medication error reporting (eight items scored as 1-4), and facilitators of medication error reporting (seven items scored as 1-5). In this part, the participants were asked to indicate their own medication errors and rate their medication error reporting in the past 12 months on a scale from zero to more than 10 cases.

Face and content validity of the questionnaire were assessed by asking 10 nursing faculty members to comment on the questionnaire and considering their

correctional comments. In order to assess the reliability of the tool, we evaluated the test-retest reliability of the questionnaire by asking 20 nurses to complete the questionnaire twice with a one-week interval. Pearson's correlation coefficient was used to find the correlation between the variables ($r = 0.83-0.90$).

The collected data was analyzed using SPSS₁₄ (SPSS Inc., Chicago, IL, USA). Descriptive statistics such as frequency, mean, median and standard deviation were used to summarize the data set.

Results

Most of the participants were female (83.9%), holding a degree in nursing (96.8%), and on a temporary employment contract (41.3%). Their mean age was 32.5 years. The mean years passed after receiving the last training certificate in pharmacology were 8.5 years. The mean number of patients per nurse per shift was 11.16. Most participants were working in 200-300-bed hospitals. The majority of subjects were working in intensive care units (31.5%) and internal medicine wards (25.8%).

Most nurses made minor medication errors without harming patients rather than major errors resulting in patient harm. The nurses whose medication errors had not harmed the patients had reported less than $\frac{1}{4}$ of their errors. However, participants with major medication errors causing patient harm had reported less than $\frac{1}{2}$ of their errors. In addition, there was a significant gap between the frequency of medication errors and the rate of medication errors reporting (Table 1).

Nurses perceived the most important barriers to medication error reporting as

blaming individuals instead of the system, fear of consequences of reporting, and fear of being punished for the error. They also identified "no need to report if no harm to patient", "medication error perceived as unimportant by nurses", and "medication error reports take too long to complete" as less important barriers to medication error report (Table 2).

The participants of this study identified the most facilitating factors of reporting medication errors as "anonymous reporting system", "a perceived benefit of reporting", and "eliminating the fearful atmosphere in the organization" (Table 3).

Discussion

This study showed that a gap between the actual rate of medication errors and the reporting rate among nurses. Nurses with trivial and major medication errors had reported less than $\frac{1}{4}$ and less than half of their errors, respectively. A research conducted in Jordan revealed that 42.1% of the nurses had made at least one medication error in their career.⁶ Another study showed that mean rate of medication errors of nurses was 19.5% while the reporting rate was as low as 1.3% in a 3-month period.¹⁴ The results of the abovementioned studies, together with the findings of the present study, indicate that medication error reporting rate is low. Although minimizing medication errors is desirable for health authorities and managers, it should be noted that minimizing the gap between medication errors and reporting rates is also an important indicator of patient safety.

Table 1. Perceptions of nurses about actual and reported rates of medication error during the past 12 months

Type of medication error	Rate of error	Rate of reporting	Priority
Without patient harm	0.96 (1.80)	0.26 (0.68)	1
Resulted to patient harm	1.90 (0.39)	0.13 (0.42)	2

Values are expressed as mean (SD).

Table 2. Nurses' perceptions of barriers to reporting medication errors in Urmia teaching hospitals in descending order

Barriers to reporting	Number of replies	Major barrier n (%)	Moderate barrier n (%)	Minor barrier n (%)	No barrier n (%)	Score Mean (SD)	95% Confidence interval	Priority
Blaming individuals instead of the system	722	29 (4.0)	58 (8.0)	177 (24.5)	458 (63.5)	3.50 (0.77)	3.44-3.56	1
Concerns over the consequences of reporting	725	45 (9.2)	78 (11.6)	211 (29.1)	391 (50.1)	3.32 (0.87)	3.20-3.39	2
Fear of punishment	720	49 (6.8)	84 (11.7)	214 (29.7)	373 (51.8)	3.26 (0.91)	3.19-3.33	3
Blaming nurses if patients are harmed	727	58 (8.0)	88 (12.1)	217 (29.8)	364 (50.1)	3.25 (0.93)	3.18-3.32	4
Incompetence	723	135 (18.6)	117 (16.2)	168 (23.3)	303 (41.9)	2.91 (1.14)	2.82-3.00	5
Too long and time consuming reporting	719	106 (14.7)	166 (23.3)	248 (34.4)	199 (27.6)	2.75 (1.01)	2.67-2.83	6
Perceiving medication error as not important	697	147 (21.0)	170 (24.3)	188 (26.9)	192 (27.8)	2.62 (1.10)	2.54-2.71	7
No need to report if no patient is harmed	715	139 (19.4)	168 (23.5)	250 (35.0)	158 (22.1)	2.58 (1.02)	2.50-2.66	8

Table 3. Perceptions of nurses about facilitators of reporting medication errors in Urmia teaching hospitals

	Number of answers	Likely n (%)	Probable n (%)	Uncertain n (%)	Unlikely n (%)	Quite unlikely n (%)	Score Mean (SD)	95% Confidence interval	Priority
Anonymous reporting	718	19 (2.6)	41 (5.7)	61 (8.5)	282 (39.3)	315 (43.9)	4.16 (0.97)	4.08-4.23	1
Benefits of reporting	715	24 (3.4)	50 (7.0)	61 (8.5)	276 (38.6)	304 (42.5)	4.11 (1.02)	4.03-4.18	2
Feeling safe about working environment	720	35 (4.9)	62 (8.6)	69 (9.6)	242 (33.6)	312 (43.3)	4.02 (1.13)	3.94-4.11	3
Harm to patient or patient vulnerability	713	24 (3.4)	50 (7.0)	80 (11.2)	291 (40.8)	268 (37.6)	4.01 (1.04)	3.94-4.09	4
Good relationship with nurse managers	720	46 (6.3)	91 (12.6)	96 (13.5)	239 (33.2)	248 (34.4)	3.76 (1.21)	3.67-3.85	5
Errors in principles of medication administration	710	71 (10.0)	82 (11.5)	41 (5.8)	287 (40.4)	229 (32.3)	3.74 (1.27)	3.64-3.84	6
Good professional relationship with physicians	715	47 (6.6)	88 (12.3)	98 (13.7)	250 (35.0)	232 (32.4)	3.74 (1.20)	3.65-3.83	7

Research from all over the world has shown that medication error is one of the most important issues to be addressed in

healthcare settings. Most importantly, it is worth mentioning that accurate error reporting is fundamental to error prevention

and patient safety.¹⁸ Therefore, devising and implementing effective error reporting systems require careful consideration in order to modify and reduce the barriers to reporting medication errors. Since, greater number of barriers would lower the reporting of errors, reducing barriers would encourage nurses to report their medication errors.¹⁹ The findings of our study revealed that nurses do not report many medication errors because they think reporting will result in repercussion. A similar study identified fear of legal liability, job threat, economic adverse effects, face saving concerns, and adverse consequences of reporting for the individual as the most important barriers to error reporting.²⁰ Mardani and Shahraki found legal liability as the main reporting barrier perceived by nursing staff.²¹ Other resources have suggested risk for social and professional status, legal and economic consequences, fear of development of patients' negative attitude, and lack of familiarization of nurses with reporting system and disclosure skills as the main barriers to error reporting.²²

It can be concluded that the first and foremost step toward a better reporting system is to create a reliable environment for nurses to feel safe to report errors without fear of consequences and repercussion. In other words, it is essential to build an environment in which it is safe for nurses to admit medication errors, learn from the error, and understand the nature of the error.

Several factors are necessary to facilitate error reporting. Findings of Maurer about the facilitators of error reporting is, to an extent, similar to the findings of the present study.¹⁹ Nurses would report medication errors when the patient is harmed or is potentially vulnerable and when reporting is thought to benefit patients and/or care providers. Other researchers believe managers' understanding and support will result in more realistic and accurate medication error reporting.^{20,23} Most surveys

have placed a high emphasis on the importance of a safe environment for error reporting. Safer environments will increase the rate of medication error reporting.²⁴

According to medical ethics principles of non-maleficence and beneficence, it is the ethical and moral duty of healthcare providers to prevent harm and to benefit patients. Medication error reporting prevents future recurrence of harm and thus benefits patients. Adopting a systematic approach to medication error reporting, improving reporting system to increase the rate of error reporting, and finding systematic and root factors of medication errors will result in a safer healthcare.

Although this research was carefully designed and conducted, the researchers are still aware of its limitations. Firstly, it was predicted that the participants may provide incorrect answers to the questions as a result of fear of disclosure. Therefore, confidentiality of demographic data was ensured and all identifiable data such as name and surname was eliminated. Tough working conditions of nurses may have influenced the information they provided in this study. Since we were not able to control this limitation, another research using similar tools to compare the findings would be beneficial. In conclusion, in order to improve patient safety, periodic training of nurses and nurse managers on aims, benefits, and processes of medication error reporting is necessary.

Ethical issues

None to be declared.

Conflict of interest

The authors declare no conflict of interest in this study.

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