

## Brief Report

# Nurses' Perspectives on the Reasons behind Medication Errors and the Barriers to Error Reporting

Mohammad Amrollahi, Narges Khanjani<sup>1</sup>, Mehdi Raadabadi<sup>2</sup>, Majid Bagheri Hosseinabadi<sup>3</sup>, Maryam Mostafae<sup>4</sup>, Seyed Ehsan Samaei<sup>5</sup>

Social Determinants of Health Research Center, Shahid Sadoughi University of Medical Sciences, Yazd, <sup>1</sup>Neurology Research Center, Shafa Hospital, Kerman University of Medical Sciences, Kerman, <sup>2</sup>Students' Scientific Research Center, Tehran University of Medical Sciences, Tehran, <sup>3</sup>School of Public Health, Shahroud University of Medical Sciences, Shahroud, <sup>4</sup>Institute for Environmental Research, Tehran University of Medical Sciences, Tehran, <sup>5</sup>Research Center for Health, Safety and Environment, Alborz University of Medical Sciences, Karaj, Iran

### ABSTRACT

**Background:** Medication errors may happen in any hospital setting. Medication error reporting can enhance patient safety and provide valuable information about reasons behind errors. **Objectives:** The present study aimed to determine nurses' perspectives on the reasons behind medication errors and the barriers to error reporting. **Methods:** This cross-sectional study was conducted in 2015 on 213 hospital nurses working in three hospitals in Kerman, Iran. Nurses working in different inpatient wards were selected through random sampling. Data were collected using a three-part questionnaire on nurses' demographic characteristics, reasons behind medication errors, and reasons for not reporting them. Data analysis was done through the independent sample *t*-test and the one-way analysis of variance. **Results:** The most and the least important reasons behind medication errors were nurses' insufficient attention to patients' medical records ( $3.63 \pm 1.29$ ) and the high number of tasks ( $2.01 \pm 0.99$ ), respectively. Moreover, the most and the least important reasons for not reporting medication errors included forgetting to report ( $2.80 \pm 1.20$ ) and fear over being blamed by doctors ( $2.03 \pm 0.98$ ), respectively. **Conclusion:** Nurse- and management-related factors were the most important reasons behind medication errors and not reporting them, respectively. Designing an efficient system for medication error reporting and a systematic approach for evaluating and managing error risk factors is recommended.

**KEYWORDS:** *Error reporting, Hospital, Medication errors, Nurse, Patient safety*

## INTRODUCTION

Medication error is a major health concern and challenge around the world. It is an indicator of patient care quality. Despite its serious consequences, medication error is preventable.<sup>[1]</sup> According to the Institute of Medicine reports, medical errors in the United States (US) lead to 44,000–98,000 deaths each year, from which more than 7000 are related to medication errors.<sup>[2,3]</sup>

In the recent years, the number of patient complaints about medication errors has increased in Iran. From about 55,000 medication errors occurred each year in Iran, 10,500 led to death and 23,000 caused disability. In 2007, medication error incidence rate was 8%, which is about 2.4–5.6 times more than the rate in the USA.<sup>[4]</sup> Yet,

determining the true incidence rate of medication errors is difficult because many different factors contribute to error classification and reporting. Moreover, most medication errors are usually not reported<sup>[5]</sup> due to different reasons. Fear over prosecution is one of the main reasons behind not reporting errors.<sup>[3]</sup>

Reporting medical errors can minimize the complications of errors and increase patient safety. It can also shorten hospitalization stay, reduce health-care costs, and lower the incidence of errors.<sup>[6]</sup> Identifying

**Address for correspondence:** Mr. Seyed Ehsan Samaei, Research Center for Health, Safety and Environment, Alborz University of Medical Sciences, Karaj, Iran. E-mail: [samaeiehsan89@gmail.com](mailto:samaeiehsan89@gmail.com)

This is an open access article distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 3.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as the author is credited and the new creations are licensed under the identical terms.

**For reprints contact:** [reprints@medknow.com](mailto:reprints@medknow.com)

**How to cite this article:** Amrollahi M, Khanjani N, Raadabadi M, Hosseinabadi MB, Mostafae M, Samaei SE. Nurses' perspectives on the reasons behind medication errors and the barriers to error reporting. *Nurs Midwifery Stud* 2017;6:132-6.

Access this article online	
<b>Quick Response Code:</b> 	<b>Website:</b> <a href="http://www.nmsjournal.com">www.nmsjournal.com</a>
	<b>DOI:</b> 10.4103/nms.nms_31_17

factors contributing to medication error can help prevent their re-occurrence.

**Objectives**

The present study aimed to determine nurses' perspectives on the reasons behind medication errors and barriers to error reporting.

**METHODS**

**Study design and participants**

This cross-sectional study was done in 2015. The study population consisted of all 1278 nurses working in three teaching hospitals affiliated to Kerman University of Medical Sciences, Kerman, Iran. The selection criteria included having direct contact with patients, having a work experience of more than two years, and holding a bachelor's degree in nursing. With a medication error incidence rate of 79%<sup>[7]</sup> and a confidence level of 0.95, sample size calculation formula [Figure 1] revealed that at least 231 nurses were needed. Sampling was done through stratified random sampling. Initially, a list of all nurses in each hospital was created, and the number of nurses who needed to be sampled from each hospital was determined. Then, nurses were randomly recruited from each hospital.

**Study instruments**

Three questionnaires were used for data gathering. The first was a demographic questionnaire including items on nurses' demographic and organizational characteristics. The second questionnaire was about the reasons behind medication errors. This questionnaire had 28 items in four dimensions, namely, nurse-related (8 items), workplace-related (5 items), management-related (10 items), and medication-related reasons (5 items). A 5-point Likert-type scale (from 1 = very low to 5 = very high) was used for scoring. Higher scores showed greater item importance. The validity and reliability of this questionnaire had been confirmed in another study.<sup>[8]</sup>

The third questionnaire was about the reasons behind not reporting medication errors. This questionnaire included 19 questions in the following three dimensions: fear over the consequences of reporting (11 items), management-related

factors (5 items), and reporting-related factors (3 items). A 5-point Likert-type scale (from 1 = strongly disagree to 5 = strongly agree) was used for scoring. The validity and reliability of this questionnaire had also been confirmed in an earlier study.<sup>[7]</sup>

The first author referred to the hospitals in the morning, evening, and night shifts, recruited eligible nurses, and asked them to complete the questionnaires.

**Ethical considerations**

The present study was approved by the Ethics Committee of Kerman University of Medical Sciences, Kerman, Iran (with the code of KA.92.601). All nurses were made aware of the purpose of the study and verbally consented to participate. The data were managed confidentially and participants had the right to voluntarily withdraw from the study.

**Data analysis**

Data analysis was done using the SPSS software, version 13.0 (SPSS Inc., Chicago, IL, USA). Descriptive statistic measures were reported for all variables. The Kolmogorov–Smirnov test was used to examine the normality of the data. The independent sample *t*-test was run to examine the differences in the reasons behind medication errors among the nurses of different genders, work shifts, educational degrees, and marital status. Moreover, the one-way analysis of variance was

**Table 1: Participating nurses' demographic characteristics**

Variable	Frequency (%)
Age group (years)	
20-30	96 (45.1)
31-40	96 (45.1)
41-50	21 (9.8)
Gender	
Male	42 (19.7)
Female	171 (80.3)
Marital status	
Single	57 (26.8)
Married	156 (73.2)
Working shift	
Fixed	105 (49.3)
Rotational	108 (50.7)
Work experience (years)	
1-10	129 (60.5)
11-20	66 (31)
21-30	18 (8.5)
Educational degree	
Bachelor's	195 (91.5)
Master's	18 (8.5)
Second job	
Yes	51 (23.9)
No	162 (76.1)

$$n = \frac{Npqz^2}{Nd^2 + pqz^2}$$

$$n = \frac{1278 * 0.79 * 0.21 * (1.96)^2}{(1278 * 0.05^2) + (0.79 * 0.21 * 1.96^2)} = 212.67 \cong 213$$

**Figure 1: Sample size calculation formula**

**Table 2: Frequency, mean, and standard deviation of the reasons behind medication errors and reasons for not reporting them**

Reasons behind medication errors						
Reasons	Item	High and very high	Medium	Low and very low	Mean±SD	
Nurse related	Lack of pharmacology knowledge	78 (36.6)	90 (42.3)	45 (21.1)	2.72 ± 1.11	
	Errors in calculating drug dosage	60 (28.2)	63 (29.6)	90 (42.3)	3.15 ± 1.22	
	Insufficient attention to patients' medical records	55 (25.8)	68 (31.9)	90 (42.3)	3.63 ± 1.29	
	Job dissatisfaction	54 (25.4)	69 (32.4)	90 (42.3)	3.31 ± 1.33	
	Dissatisfaction with income	117 (54.9)	45 (21.1)	51 (11.3)	2.46 ± 1.37	
	Personal problems	96 (45)	63 (29.6)	54 (25.4)	2.7 ± 1.26	
	Occupational stress	123 (57.7)	66 (31)	24 (11.2)	2.37 ± 1.07	
Workplace related	Fatigue due to heavy workload	150 (70.5)	48 (22.5)	15 (7)	2.11 ± 0.96	
	Environmental noises	84 (39.4)	75 (35.2)	54 (25.3)	2.76 ± 1.15	
	Problems related to ward rooms (such as poor lighting)	105 (49.3)	57 (26.8)	51 (24)	2.58±1.29	
	High number of tasks	141 (66.2)	60 (28.2)	12 (5.6)	2.01 ± 0.99	
	Improper drug arrangement in shelves	75 (33.8)	81 (38)	57 (26.8)	2.89 ± 1.10	
Management related	Inappropriate drug protocols	69 (32.4)	78 (36.6)	66 (31)	2.94 ± 1.05	
	Lack of drug information sources in the ward	78 (36.6)	81 (38)	54 (25.3)	2.8 ± 1.12	
	Insufficient number of nurses	129 (60.6)	63 (29.6)	21 (9.9)	2.07 ± 1.10	
	Inadequate supervision	51 (24)	96 (45.1)	66 (31)	3 ± 1.05	
	Incompetent staff	63 (29.6)	105 (49.3)	45 (21.1)	2.79 ± 1.09	
	Wrong drug administration route	45 (21.1)	69 (32.4)	99(46.5)	3.27 ± 1.14	
	Illegible medical orders	150 (70.4)	30 (14.1)	33 (15.5)	2.15 ± 1.14	
	Illegible Kardex	78 (36.6)	63 (29.6)	72 (33.8)	2.9 ± 1.3	
	Working in the morning shift	42 (19.7)	87 (40.8)	84 (39.4)	3.23 ± 1.18	
	Working in the evening shift	54 (25.3)	81 (38)	78 (36.6)	3.23 ± 1.08	
	Working in the night shift	54 (25.3)	96 (45.1)	63 (29.6)	3.13 ± 1.1	
	Medication related	Diversity of drugs in the ward	72 (33.9)	81 (38)	60 (28.1)	2.93 ±1.04
		Using abbreviations instead of the full names of the drugs	84 (39.5)	75 (35.2)	54 (25.4)	2.82 ± 1.16
Similarity in drug names		96 (47.1)	66 (31)	51 (24)	2.73 ± 1.14	
Similarity in drug shapes		93 (39.6)	81 (38)	39 (18.3)	2.73 ± 1.06	
Availability of different doses of a single drug		60 (28.2)	120 (56.3)	33 (28.2)	2.58 ± 0.88	
Reasons for not reporting medication errors						
Reasons	Item	Agree and strongly agree	No idea	Disagree and strongly disagree	Mean±SD	
Fear over the consequences of reporting	Fear over the negative effects of error reporting on the results of annual staff evaluation	117 (54.9)	66 (31)	30 (14.1)	2.38 ± 1.02	
	Fear over the negative effects of error reporting on salaries	120 (56.3)	36 (16.9)	57 (26.7)	2.55 ± 1.20	
	Fear over being blamed by the supervisor	159 (74.6)	15 (7)	39 (18.4)	2.11 ± 1.12	
	Fear over being blamed by doctors	159 (74.6)	33 (15.5)	21 (9.9)	2.03 ± 0.98	
	Fear over being blamed by colleagues	153 (71.9)	36 (16.9)	24 (11.2)	2.11 ± 0.99	
	Fear over the negative effects of the error on the patient	165 (77.5)	18 (8.5)	30 (14)	2.13 ± 1.06	
	Fear over being called as incompetent	156 (73.3)	33 (15.5)	24 (11.2)	2.1 ± 1.07	
	Fear over colleagues' reactions	138 (64.8)	33 (15.5)	42 (19.7)	2.31 ± 1.12	
	Fear over the negative effects of error on the patient/family	141 (66.2)	57 (26.8)	15 (7)	2.14 ± 0.99	
	Fear over prosecution	147 (69)	48 (22.5)	18 (8.5)	2.1 ± 0.97	
Management related	Fear over informing colleagues in other units and facilities about one's medication error commitment	132 (62)	51 (23.9)	30 (14.1)	2.23 ± 1.03	
	Nursing supervisors' unconstructive feedback and reaction to the report of errors	126 (59.1)	54 (25.4)	33 (15.5)	2.35 ± 1.03	
	Erroneous beliefs	133 (62.4)	58 (27.3)	22 (10.3)	2.28 ± 0.92	

*Contd...*

Table 2: Contd...

Reasons	Item	Reasons behind medication errors			Mean $\pm$ SD
		Agree and strongly agree	No idea	Disagree and strongly disagree	
Reporting related	Managers' focus on error maker instead of the reason for the error	144 (67.6)	48 (22.5)	21 (9.9)	2.14 $\pm$ 0.99
	Unfair supervisory reactions which are disproportionate to error seriousness	123 (57.7)	60 (28.2)	30 (14.1)	2.41 $\pm$ 0.96
	Unfair supervisory reactions which are disproportionate to error seriousness	126 (59.1)	57 (26.8)	30 (14.1)	2.3 $\pm$ 0.98
	Inattention to the reporting of some medication errors	102 (47.9)	72 (33.8)	39 (18.3)	2.62 $\pm$ 0.88
	Unclear definition of medication errors	90 (42.3)	63 (29.6)	60 (28.1)	2.79 $\pm$ 11.1
	Forgetting to report medication errors	99 (46.5)	39 (18.3)	75 (35.2)	2.80 $\pm$ 1.20

SD: Standard deviation

performed to determine the differences in the reasons behind medication errors among nurses with different age and work experience groups. The significance level for all tests was set as  $<0.05$ .

## RESULTS

More than 80% of nurses were female. Table 1 summarizes nurses' demographic characteristics.

The highest-scored nurse-, workplace-, and management-related reasons behind medication errors were, respectively, insufficient attention to patients' medical records ( $3.63 \pm 1.29$ ), inappropriate drug protocols ( $2.94 \pm 1.05$ ), and wrong drug administration route ( $3.27 \pm 1.14$ ) [Table 2].

On the other hand, the most important reasons for not reporting medication errors were fear over the negative effects of error reporting on salaries ( $2.55 \pm 1.20$ ), unfair supervisory reactions which are disproportionate to error seriousness ( $2.41 \pm 0.96$ ), and forgetting to report medication errors ( $2.80 \pm 1.20$ ) [Table 2].

There were no significant differences among nurses of different ages, genders, work shifts, educational degrees, and marital status with respect to the reasons behind medication errors and the reasons for not reporting medication errors.

## DISCUSSION

In this study, the most important reasons behind medication errors were nurse-related factors such as nurses' insufficient attention to patients' medical records, their job dissatisfaction, and errors in calculating drug dosage. Therefore, implementing in-service training programs for enhancing nurses' awareness of the importance of preadministration adequate assessment of patients and their drug history can help reduce the rate of medication errors.

Nurses' job dissatisfaction was another reason behind medication errors. The causes of job dissatisfaction are

multifactorial. Previous studies reported that insufficient number of nurses, severe fatigue due to extra working hours, heavy workload, and job specifications not only affect nurses' job satisfaction,<sup>[9]</sup> but also increase the possibility of errors in drug dose calculation.<sup>[10]</sup>

The results of this study also showed that management-related factors were the main reason for not reporting medication errors by nurses. This finding is consistent with the findings of earlier studies conducted in Iran<sup>[7,11]</sup> and Saudi Arabia.<sup>[12]</sup> Inadequate managerial feedback is a main reason for not reporting. This problem can be managed through improving nurse-manager relationships and creating more efficient reporting systems. Nurse managers should also clearly define the concept of medication error and train nurses about the benefits of error reporting. Such strategies can facilitate error self-reporting and enhance patient safety.

This study was solely conducted in teaching hospitals. Futures studies are recommended to replicate this study in private hospitals.

## CONCLUSION

Nurse-related factors are the main reasons behind medication errors while management-related factors are the main reasons for not reporting medication errors. Error rate can be reduced through establishing efficient reporting and feedback systems. Nurses need to be able to self-report medication errors without any fear over reporting-related consequences.

## Acknowledgments

The authors would like to express their appreciation to the nurses working in the hospitals affiliated to Kerman University of Medical Sciences who participated in the study.

## Financial support and sponsorship

This study was supported by the deputy of research at Kerman University of Medical Sciences, Kerman, Iran.

## Conflicts of interest

There are no conflicts of interest.

## REFERENCES

1. Zare ZG, Purfarzad Z, Adib-Hajbaghery M. Medication management skills of nursing students: Comparing the students and their instructors' evaluation in two universities. *Nurs Midwifery Stud* 2013;1:139-45.
2. Sharek PJ, Classen D. The incidence of adverse events and medical error in pediatrics. *Pediatr Clin North Am* 2006;53:1067-77.
3. Bahadori M, Ravangard R, Aghili A, Sadeghifar J, Gharsi Manshadi M, Smaeilnejad J, *et al.* The factors affecting the refusal of reporting on medication errors from the nurses' viewpoints: A case study in a hospital in Iran. *ISRN Nurs* 2013;2013:876563.
4. Taheri E, Norian M, Rasoli M, Kavooosi A. The study of type and amount of medication errors in neonatal Intensive Care Units and neonatal units. *J Crit Care Nurs* 2013;6:21-8.
5. Boyle TA, Mahaffey T, Mackinnon NJ, Deal H, Hallstrom LK, Morgan H, *et al.* Determinants of medication incident reporting, recovery, and learning in community pharmacies: A conceptual model. *Res Social Adm Pharm* 2011;7:93-107.
6. Anderson P, Townsend T. Medication errors: Don't let them happen to you. *Am Nurse Today* 2010;5:23-8.
7. Mirzaei M, Khatony A, Safari Faramani R, Sepahvand E. Prevalence, types of medication errors and barriers to reporting errors by nurses in an educational hospital in Kermanshah. *Hayat* 2014;19:28-37.
8. Hosseinzadeh M, Ezate Aghajari P, Mahdavi N. Reasons of nurses' medication errors and perspectives of nurses on barriers of error reporting. *Hayat* 2012;18:66-75.
9. Hesari B, Ghodsi H, Hoseinabadi M, Chenarani H, Ghodsi A. A survey of nurses' perceptions of the causes of medication errors and barriers to reporting in hospitals affiliated to Neyshabur University of Medical Sciences, Iran. *J Kerman Univ Med Sci* 2015;22:105-11.
10. Alsulami Z, Conroy S, Choonara I. Medication errors in the middle east countries: A systematic review of the literature. *Eur J Clin Pharmacol* 2013;69:995-1008.
11. Tol A, Mohebibi B, Gazi Z. The causes of not reporting medication errors from the viewpoints of nursing in Baharlo hospital in 2010. *J Hosp* 2010;9:19-24.
12. Ala'a Z, Aljasser IA, Sasidhar B. Barriers to reporting medication administration errors among nurses in an accredited hospital in Saudi Arabia. *Br J Econ Manage Trade* 2016;11:1-13.