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Research Article

Factors influencing medication errors according to nurses' decisions to do self-report

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ABSTRACT

Background: There are many factors associated with medication errors. These errors are mainly related to nursing care, including error in medication administration and omission. Nurses make up the largest group of health workers. Hence, quality of health care depends to a great extent to nurses. Nurses who work in hospitals with inadequate human resources and have more working hours are more likely to commit errors. This study aimed at determining the incidence of medication errors and factors affecting it according to nurses' self-report.
Methods: This is a descriptive analytical study in which 100 nurses in beast hospital in Sanandaj, Iran were selected randomly from different shifts. The questionnaire consisted of 2 sections. The first section consisted of 17 questions on demographic information including age, sex, type of activity, duration of service, hospital ward and location, error during the years of service, reporting or non-reporting of mistakes and type of mistake. The second part of the tool consisted of 25 items rated to 1-to-5 likert scale, which checked out medical errors in 5 domains. For ethical issues, anonymous questionnaires were distributed with bar codes. Then the data were entered into SPSS version 16 and analyzed.
Results: All the participants in this study had a history of medication error in the previous year. In 12% of the cases, association between workload and medication error were too high, 22% was high, 54% was average and 6% was low.
Conclusions: The results of this study showed that the most important factors affecting the incidence of errors include workplace stress, working in the intensive care units, tiredness due to work load, and inappropriate nurse physician relationship. Hence, identification of these factors helps nurses to reduce errors and helps reduce other medical consequences and improve in the quality of patient care and patient safety. Regarding the importance of patient safety it is necessary to improve positive relationship between nurse managers and nursing staff. Therefore, an environment of close collaboration, in-service training for new nurses regarding medication errors, and creating a reporting system is necessary.

Keywords: Medication error, Nurse, Patient safety, Self-reported questionnaire

INTRODUCTION

Patient safety is one of the most serious healthcare challenges in the world, therefore reducing medication errors and improving patient safety is a priority. Merely counting medication errors will not lead to significant improvements in reducing medication errors. Expecting each hospital to conduct counting medication errors and find solutions is not a good answer. Even when an institution identifies the root cause of an incident, findings are not shared among institutions.[1]

In the recent years, a variety of factors such as raising trend of drug production has increased the risk of medication errors. There are many factors associated with medication errors. Errors related to medication are more or less limited to errors that occur when the patient receive the medication or is scheduled to receive it.[1] These errors are mainly related to nursing care including error in medication administration and omission. Medical errors occur when one or more of the five principles of medication are violated including choosing the right patient, right dosage, right medication, right time and right method of administration. The omission errors occur when the patient does not receive the medication at all.[1] According to the results of a study conducted by Panjvini (2006) nurses in Sanandaj, Iran, committed 16.7% of medication errors. In most of the cases, the errors were

giving the wrong dose of the drug omission in medication.[2] Nurses make up the largest group of health workers. Hence, quality of health care depends to a great extent to nurses.[3] Nurses are the major responsible persons for giving medication. Medicine administrations consume more than 40% of the nurses' time.[4] Medication errors may occur in all types of prescription and occur mainly in the preparation, delivery, and administration of medication. The human factor is the main cause of medication errors.[5] According to studies, about one-third to one-half of all adverse drug events is preventable. Adverse drug events in hospitals are variable from 2.4 to 6.5 of every 100 patients leading to longer hospitalization, increased economic burden, and increased risk of death. Today, one of the fundamental concepts in health care delivery is patient safety, which is the most important priority in the health care systems of many countries. Nurse's knowledge and experience is a significant factor related to nursing, which have a significant impact on the quality of nursing care, including drug prescription.[6] One of the reasons behind it might be a deficiency of nurses' knowledge on drugs and their need for training.[7] Primary and natural result of medication errors, which is the most common events in a nursing profession could increase the length of hospital stay leading to increased hospital costs and in some cases may initiate severe injury or even death.[8] Factors such as inadequate communication between team members, environmental performance, increased workload,[9] low precision, neglect, low work experience, less education are all effective in committing nursing errors.[10] More experienced nurses communicate better with nurse managers and have greater recognition on the work of the group.[11] Effective group work should be coordinated, integrated and performed by standard methods.[12] Knowledge is one of the factors affecting the incidence in nursing errors and could be a great factor in avoiding these errors.[13] Professional environmental performance may increase job satisfaction and quality of care. Environmental performance, include effective nursing management and nurse physician communication. International health service managers and consultants suggest that environmental performance effect hospital and patient's outcome.[14] Many studies suggest that nurses' work condition is responsible for most of the errors. Nurses who work in hospitals with inadequate human resources and have more working hours are more likely to commit errors.[15] Nurses have the main role in hospitals and are involved in the care of patient's medication. Errors are a serious threat to the health and safety of the patient as well as the nursing profession as a whole. Given the importance of the nursing profession, a large number of medication errors are preventable; therefore, this study aimed at determining the incidence of medication errors and factors affecting it according to nurses' self-report.

METHODS

This is a descriptive analytical study to determine the incidence of medication errors and factors affecting it conducted in the hospital wards affiliated to the Kurdistan University of Medical Sciences in the year 2011. A questionnaire was used to collect data. The questionnaire consisted of 2 sections. The first section consisted of 17 questions on demographic information including age, sex, type of activity, duration of service, hospital ward and location, error during the years of service, reporting or non-reporting of mistakes and type of mistake. The second part of the tool consisted of 25 items rated to 1-to-5 Likert scale which checked out medical errors in 5 domains including items related to nursing (questions 1-10), items related to teamwork (questions 11-15), workload (questions 16-19), and environmental factors (questions 22-25). Validity of the tool was confirmed through content validity, and its reliability was 0.84. Study participants were 100 nurses in Beast hospital in Sanandaj, Iran, who were selected randomly in different shifts and then they completed informed consent and questionnaires. For ethical issues anonymous questionnaires were distributed with bar codes. Then, they were distributed after obtaining necessary permissions from the ethical committee of the faculty of nursing. Then, the data were entered into SPSS version 16 and analyzed.

RESULTS

Participants included 58% female, 50% were married, 40% employed by contract and 30% with a history of <5 years of employment. The average age of study participants was 29.48±4.67 years (Table 1). About the frequency of medication errors, the results show that all of the participants in this study had a history of medication error in the previous year (Table 2). About 13% of them reported 87% error and nurses had more than one error (Table 3).

There is a significant correlation between workload and errors. Relationship between workload and medication errors were very high in 12% of the cases, 22% were high, 54% were average and 6% were low (Table 4).

DISCUSSION

The results of this study showed that all of the participants in this study had experience of medical error in the previous year. 87% of the subjects had more than once error and 13% of them mentioned one time error. The most common medication errors were wrong patient (26%), dose and duration of treatment (23%), wrong medication (19%), and medication administration (9%). In a study conducted by Gillian (2001), who lasted from July 1998 to June 2001, 127 cases of medication errors were reported. 29% were related to the prescribing physician and 61% were related to the nurses who were administered the medication.[15] The study results in some cases are compatible with the results of our study. The results of this study showed that the most important factors affecting the incidence of errors include workplace stress, working in the intensive care units, tiredness due to work load,

Table 1: Demographic characteristics of the participants in the study.

Variable	Absolute frequency	Relative frequency
Age		
<25 years	16	16
25-35 years	43	43
35-45 years	34	34
≥45	7	7
Sex		
Female	58	58
Male	42	42
Marital status		
Single	50	50
Married	50	50
Level of education		
BS in nursing	100	100
MS in nursing	-	-
Employment status		
Regular	39	39
Long term contract	40	40
Short term contract	13	13
Planned contract	8	8
Work experience (years)		
<5 years	30	30
5-10 years	45	45
≥10	25	25

Table 2: History of medication errors in beast hospitals.

History of medical error in the last year	No.	Percent
Yes	100	100
No	0	0
Total	100	100

Table 3: The number of medication errors in beast hospitals.

Number of medication errors	No.	Percent
Once	13	13
More than once	87	87
Total	100	100

and inappropriate nurse physician relationship. There is a significant relationship between environmental factors and medication errors. In 54% of the cases, relationship between environmental factors and medication error were as follows: High (21%), low (14%), and very low (11%). There was a significant correlation between workload and errors. In 12% of the cases, association between workload and medication error were too high,

Table 4: Relationship between environmental factors and number of medication errors in Beast hospital.

Work load	Frequency				
	Once	Twice	3 times	More than 3 times	Frequency (%)
Very high	-	9	-	3	12
High	-	10	4	8	22
Average	7	25	12	10	54
Low	3	-	3	-	6
Very low	3	-	-	3	6
Total	13	44	19	24	100

p=0.001

22% was high, 54% was average and 6% was low. Haw et al. (2005) conducted a study to assess nurses' views on the relation between medication errors and other factors in England. They concluded that from the view point of nurse's, workplace noise as well as individual personality factors such as fatigue resulting from work load or lack of adequate support were among most of the causes of medical error.[16] The results of the study conducted by the United States pharmacopoeia at 482 hospitals and health care institutions in the field of medication errors showed that the main causes of medication errors were due to errors in the method and manner of medication administration, disturbance in the working environment, change in the shift, and increased staff workload which in some cases results were compatible with the results of our study.[14] The results showed that the main type of medication errors were choosing the wrong patient (26%), wrong dose, and timing errors (23%), medication type (19%) and the least error was related to the administration of medication (%9) In this study, the wrong dose of a drug is the second type of error. In a study by Tang et al. (2007), the highest form of medication error was giving the wrong dose of medication.[17] In a study conducted by Dean et al. (1995), in British and American nurses about the amount and type of medication errors, they found that missed and wrong doses of medication were among the most common medication errors in British nurses and non-prescribed medication errors were among the most errors committed by American Nurses.[18] Panjvini study (2006) to determine the amount and type of medication errors in nursing staff results indicated that 16.7% of medication errors and most of the errors were related to omission of the medication or giving the wrong dose.[2] Since factors such as teamwork and care factors (age, work experience and education) are the most important predictors of medication errors, we can conclude that human and organizational factors play a major role in medication errors. Hence, identification of these factors helps nurses to reduce errors and helps reduce other medical consequences and improve in the quality of patient care and patient safety. Regarding the importance of patient safety it is necessary to improve positive relationship between nurse managers and nursing staff. Therefore, an environment of close collaboration,

in-service training for new nurses regarding medication errors, and creating a reporting system is necessary.

CONCLUSIONS

Reluctance to admit medication errors is the greatest obstacle. Therefore, it is essential that nurses put pride, ego, and fear aside if they are to improve the level of patient care. Nurses who say they have never had a medication error, has not done many of the procedures in question, has a poor memory or does poor patient care, or are not on intimate terms with the truth. In addition, hospitals should develop a program for analyzing medication error, develop root-cause analysis procedures, evaluate methods to improve patient safety, and, perhaps most important, educate nurses about the findings.

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