# Prevalence and cause of common medication administration errors in nursing

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**ABSTRACT**

**Background and aim**: One of the basic fundamentals of nursing practice is drug administration which needs skills, technique and paying attention to clients. Drug administration errors can cause serious difficulties in nurse's work and make the patients exposed to preventable hazards. This study aimed to determine the prevalence and cause of common medication administration errors in nursing was conducted.

**Materials and Methods:** This study is a descriptive cross-sectional study and the study samples were 120 nursing staff. Data collecting tool was a researcher made questionnaire, which distributed among the samples after appointing its validity and reliability. A total number of 120 completed questionnaires were collected from subjects and then analyzed by SPSS. 15 software. Descriptive statistics (Frequency, mean and standard deviation) were applied to the data.

**Results:** The study findings showed that 86% of nurses had medication errors. The most common type of medication errors were including: wrong in giving the correct dosage, omission and wrong speed infusion.
In investigating the causes of medication errors revealed that fatigue resulting from heavy workload, nursing shortage and nurses' pharmacology Knowledge deficit and illegible physician order is main causes of medication errors among nurses.

**Conclusion:** According to of the findings of this study, all drug errors are preventable. Increasing the number of patients presence of ill patients have a role in occurring errors in drug administration, which propounds the necessity of conducting educational classes and annually pharmacological examinations for nurses and adjusting the proportion of nurses number to patients.

**KEY WORDS:** Drug errors, Nurse, Drug administration.

## 1. INTRODUCTION

A medication error is defined as a preventable event related to medication which results in 'a failure in the treatment process that leads to, or has the potential to lead to, harm to the patient' (Cloete, 2015). The primary consequences of such an errors will result to increase hospitalized duration and cost of treatment and in some cases severe damage and even death in patients (Lisby, 2005). Medication errors are among the one of the five categories of medical errors classified by the US Institute of Medicine and is a global problem (Yousefi, 2015; Rafat, 2015). European studies have shown that 19 to 28% of patients, have been under medication errors (Mohammad Nejad, 2010).

Although medication errors can be caused by all members of health care team, nursing medication errors are the most common (Mrayyan, 2007) and in nursing profession, medication errors are the common accidents (Koohestani, 2008). The reason is that nurses execute the majority of medical orders and spend about 40% of their time in the hospital to administer medicines (Cheragi, 2013). On the causes of medication errors in nursing, results of studies have shown, Issues such as lack of knowledge of pharmacology, pharmaceutical calculations incorrect, failure to follow protocols planned, and physician's bad handwriting, existence of similarities in shape and packaging and name of drugs (Cheragi, 2013; Keers, 2013; Koohestani, 2008; Mrayyan, 2007; Wong, 2004; Yousefi, 2015). Of course, issues such as work stress, fatigue, and inadequate number of staff, lack or shortage of vehicles or equipment, including the hidden items that are indirectly contribute to incidence of medication errors (Cheragi, 2013; Keers, 2013).

The first step towards patient safety and the proper administration of medications is Inform the present situation is the prevalence, incidence and type of medication errors. Regarding the importance of understanding the concept of medication errors And taking measures to reduce its occurrence, this study aimed to determine the prevalence of common medication errors and cause of them at viewpoint of nurses in Imam Khomeini Hospital of Urmia was conducted.

## 2. MATERIALS AND METHODS

This study is a descriptive cross-sectional study, in which the prevalence and cause of common medication administration errors by nursing staff were analyzed in Urmia Emam Khomeini hospital Iran, in 2014. A total of 120 nurses were recruited by systematic sampling. Meaning that list was prepared of all nurses and each was assigned a

number, then subjects were randomly entered the study. The subjects were assured that their information would remain confidential and are used only for research purposes. The inclusion criteria of the study were having physical and mental health, at least one year clinical experience and having at least a bachelor's degree in nursing. A researcher-made questionnaire was used for gathering data. This questionnaire was prepared in two parts. The first part includes demographic data such as age, sex, education level, etc. The second part consists of 8 specific questions about the measurement of medication errors in nursing staff and 2 general question about the factors affecting the incidence of medication errors. Content validity was used for data validity. In this regard, the questions were reviewed by ten of nursing experts. So, it was edited after receiving comments. The reliability of the questionnaire was studied with ten nurses, which had the characteristics of studied subjects. Then, the Cronbach's alpha was used to obtain interclass correlation coefficient. The obtained results were presented with an acceptable level of scientific confidence ($\alpha$=0.72). After confirming the validity and reliability, the questionnaires were distributed among studied individuals and after gathering data from the subjects, the collected data were analyzed by descriptive statistics (Frequency, mean and standard deviation) using Spss software (version 15).

## 3. RESULTS

Of the total subjects, in terms of gender distribution, 89.2% of participants were female. The average age of the participants was 30.3 ± 6.30 years old. Average work experience of nurses participating in the study was 5 ± 6/4 years and 97% of Subjects had a bachelor's degree.

The study findings showed that 86% of nurses had medication mistakes. According to Table.1, the most common type of medication errors were including wrong in giving the correct dosage, omission and wrong speed infusion.

According to Table.2, in investigating the causes of medication errors revealed that fatigue resulting from heavy workload, nursing shortage and nurses' pharmacology Knowledge deficit and illegible physician order is main causes of medication errors among nurses.

**Table.1. Common medication administration errors among nurses**

| | Frequency | Percent |
|---|---|---|
| Errors in IV injection rather than IM (and vice versa) | 12 | 12.50 |
| Omission | 16 | 16.66 |
| Wrong in giving the correct dosage | 19 | 19.79 |
| Giving medication to patients without physician prescription | 10 | 10.41 |
| Giving the wrong medicine to other patients during drug therapy | 7 | 7.29 |
| Entering wrong medication orders from kardks to patient records | 12 | 12.50 |
| Giving the medication at the wrong time | 6 | 6.25 |
| Wrong speed infusion | 14 | 14.58 |

**Table.2. Causes of medication errors**

| Factors | | Frequency | Percent |
|---|---|---|---|
| Pharmaceutical agents | Too much types of medication | 4 | 4.16 |
| | The use of abbreviated names | 7 | 7.29 |
| | Pharmaceutical naming similarities | 9 | 9.37 |
| | Different drug dosages | 4 | 4.16 |
| Management and human | Fatigue resulting from heavy workload | 20 | 20.88 |
| | Nursing shortage | 12 | 12.50 |
| | Inadequate training of personnel | 8 | 8.33 |
| | nurses' pharmacology Knowledge deficit | 13 | 13.54 |
| | Incorrect drug calculation | 5 | 5.20 |
| | Illegible physician order | 10 | 10.41 |
| | Illegible Kartks | 4 | 4.16 |

## DISCUSSION

The report of medication error in this study was 86%. The most common type of medication errors were including wrong in giving the correct dosage, omission and wrong speed infusion. In a systematic review aimed to determine the prevalence and nature of medication errors in health care revealed the incidence of medication errors in the whole 6/19 percent and three main factors of incidence of medication administration errors in their study was includes wrong in giving the correct dosage, omission and giving the medication at the wrong time (Keers, 2013). Based on another study results, omission and wrong in giving the correct dosage in British's nurses and wrong in giving the correct dosage, giving medication to patients without physician prescription in American's nurses were reported as a most common medication administration errors (Dean, 1995).

The findings of this study showed that the majority of the participants in this study had some degree medication errors. Roots of this problem can include High number of patients, nurse's shortages, and fatigue from

overworking, lack of Pharmacology knowledge. High number of inpatient and nursing shortage can lead to increased workload and fatigue of nurses. This causes reduce the quality of work, increased errors and accidents (Amundsen and Sagberg, 2003). In the hospital jobs due to the sensitive nature of the health and save the lives of patients, the relationship between staff fatigue with committing the errors, is very important (Hart and Staveland, 1988; Soroush, 2008).

Pharmacology or knowledge of the construction and use of drugs is one of the most important scientific issues for physicians, nurses, and pharmacists. All three groups, should have sufficient knowledge of drug compounding, prescribing and use of medications for patients according to their expertise. Among them, the role of nurses is more important than others, because they are in a position that should complete the efforts of other groups (Moradi, 2016). Results of previous studies indicated that nurses' knowledge of pharmacology is insufficient and they need training (Latter, 2001; Ndosi and Newell, 2009). Because of the complexity in the drugs administration, in order to safety medication administration and clinical decision making and professional role in managing drug therapy and reducing the adverse effects and common drug errors, nurses need to be pharmacological knowledge (Wright, 2013).

## 4. CONCLUSION

It is therefore imperative that nursing managers pay greater attention to conducting educational classes and annually pharmacological examinations for nurses and adjusting the proportion of nurse's number to patients.

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## REFERENCES

Amundsen A.H & Sagberg F, Hours of service regulations and the risk of fatigue-and sleep-related road accidents, A literature review, TOI Report, 659, 2003.

Cheragi M.A, Manoocheri H, Mohammadnejad E & Ehsani S.R, Types and causes of medication errors from nurse's viewpoint, Iranian Journal of Nursing and Midwifery Research, 18**,** 2013, 228-231.

Cloete L, Reducing medication errors in nursing practice, Nursing Standard, 29**,** 2015, 50-59.

Dean B.S, Allan E.L, Barber N.D & Barker K.N, Comparison of medication errors in an American and a British hospital, American Journal of Health-System Pharmacy, 52**,** 1995, 2543-2549.

Hart S.G & Staveland L.E, Development of NASA-TLX (Task Load Index), Results of empirical and theoretical research, Advances in psychology, 52**,** 1988, 139-183.

Keers R.N, Williams S.D, Cooke J & Ashcroft D.M, Prevalence and nature of medication administration errors in health care settings, a systematic review of direct observational evidence, Annals of Pharmacotherapy, 47**,** 2013. 237-256.

Koohestani H, Baghcheghi N & Khosravi S, Frequency, type and causes of medication errors in student nurses, Iran Journal of Nursing, 21**,** 2008, 17-27.

Latter S, Rycroft-Malone J, Yerrell P & Shaw D, Nurses' educational preparation for a medication education role, findings from a national survey, Nurse Education Today, 21**,** 2001, 143-154.

Lisby M, Nielsen L.P & Mainz J, Errors in the medication process, frequency, type, and potential clinical consequences, International Journal for Quality in Health Care, 17**,** 2005, 15-22.

Mohammad Nejad I.A.H, Hamid A Sharifniya, Seyyed Hamid A Ehsani, Seyyedeh Roghayeh, Evaluation of medication error in nursing students in four educational hospitals in Tehran, Iranian Journal of Medical Ethics and History of Medicine, 3, 2010, 60-69.

Moradi Y, Rahmani A.R, Hossain Gholipour K, Mirzaie R, Samadi N & Amin Al-Sharaa S, Nurses' pharmacology knowledge of food-drug interactions in Ayatollah Taleghani Hospital of Orumieh, Iran, Journal of Chemical and Pharmaceutical Sciences, 9**,** 2016, 1083-1087.

Mrayyan M.T, Shishani K & Al-Faouri I, Rate, causes and reporting of medication errors in Jordan, nurses' perspectives, Journal of nursing management, 15**,** 2007, 659-670.

Ndosi M.E & Newell R, Nurses' knowledge of pharmacology behind drugs they commonly administer, Journal of Clinical Nursing, 18**,** 2009, 570-580.

Rafat S, Gharib A, Rafat S & Rahimi F, Related factors in medication error based on nurses'self-report in Sanandaj, Iran, Der Pharmacia Lettre, 7**,** 2015, 198-201.

Soroush A, Hamediseresht E & Dabiran S, Assessment of sleep deprivation and fatigue among general surgery residents, Hakim Research Journal, 11**,** 2008, 35-41.

Wong I.C, Ghaleb M.A, Franklin B.D & Barber N, Incidence and nature of dosing errors in paediatric medications, Drug Safety, 27**,** 2004, 661-670.

Wright K, The role of nurses in medicine administration errors, Nursing Standard, 27**,** 2013, 35-40.

Yousefi M.S, Abed Saeedi Z, Maleki M & Sarbakhsh P, Frequency and causes of medication errors of nurses, Journal of Shahid Beheshti School of Nursing & Midwifery, 24**,** 2015, 8454.