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Medication errors of nurses in the emergency department in Saudi Arabia

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Abstract: **One of the fundamental ideas in the healthcare industry and a crucial component of the caliber of medical care is patient safety. Finding prescription mistakes and their causes is one of the crucial steps in promoting patient safety. The most frequent health-threatening errors and a worldwide issue are treatment errors, as B. Medication errors. Executing medicine prescriptions is a critical component of a nurse's performance and a crucial aspect of the treatment and care process.**

The purpose of this study was to examine the reporting rate of medication errors, the types of errors, and their causes among emergency department nurses. In this descriptive study, 94 nurses from the emergency department of King Fahad Medical city were selected based on the census. 2010-2011. The data collection tool was a researcher-designed questionnaire consisting of two parts: demographic information and types and causes of medication errors. After confirming the superficial validity of the content, the reliability of the questionnaire with Cronbach's alpha was determined to be 0.91. test.

The data analyzes were performed using descriptive statistics and inferential statistics. SPSS-16 software was used in this study and P values less than 05 were considered significant. The average age of the nurses was 27 years.

7 ± 3.4 years and her professional experience was 7.3 ± 3.4 years. Of the participants 46.

8% had made medication errors in the last year and the majority (69.04%) had made the errors only once. The predominant types of medication errors related to infusion rates (33.

3%) and administer two doses of medication instead of one (23.8%). The most important causes of medication errors were the lack of nurses (47.6%) and the lack of sufficient pharmacological information (30).

9%). This study demonstrated that medication errors are a significant nursing issue in the emergency department and that there is a substantial chance of medication errors among nurses. The number of nurses should be increased, emergency department nurses' workload should be adjusted, professional development training should be provided to staff to improve their knowledge of drugs, the training procedure should be changed, nurses should be encouraged to report medical errors, and hospital administrators should be encouraged to constructively respond to errors. enhancing patient security

Keywords: **medication errors, nurse, patient safety, emergency department.**

1. INTRODUCTION

The identification of drug mistakes and their causes is one of the top concerns in healthcare systems (3,4). Many efforts have been made to increase patient safety since the Institute of Medicine (IOM) raised awareness of human error in 2000, including: B. the epidemiological and etiological detection of drug errors (5). Studies show that these mistakes and the related financial implications of prescription side effects cause thousands of deaths annually in the

US. Studies have shown that pharmaceutical errors, side effects, failure to take the prescribed drug, and poor medication delivery increase hospital expenditures and length of stay by 2 days and by $2,000 to $2,500 per patient (10).

Lack of patient continuity in the emergency department (ED), combined with a weak information infrastructure for care across the continuum, frequently necessitates emergency medical services to treat patients without the knowledge required to make educated decisions. (1,2)

In light of this, it has been hypothesized that the environment in the ED might be more prone to pharmaceutical mistakes than other areas within the hospital

In their capacity as direct patient caregivers, nurses have a unique opportunity to contribute significantly to the reduction of medical errors. For many patients entering the hospital, the emergency department (ED) acts as the point of admission. Due to the possible influence, they may have on patients' overall hospital experiences, errors that take place in this context are of particular importance. The possibility exists for nurses working in the emergency department to have a significant impact on patient safety. (11,12). This is due to the fact that nurses account up the largest therapy team, frequently fill prescription requests, and spend 40% of their time in hospitals giving patients medication (13,14). Caregiver medication errors can result in a variety of issues, including the healthcare system '18'. Common pharmaceutical mistakes include timing, prescription, overprescribing, inaccurate prescribing, medicine concentration, and giving the wrong medication to the wrong patient as a result of addiction. Patient identification (19). Important contributing factors to medication errors include: a) personal factors like stress, fatigue, distractions, errors in prescription, lack of focus, dissatisfaction with work and job, lack of duty or work awareness, etc.; b) predisposing factors like lack of qualified staff, excessive overtime, long working days, busy environment, provision of in-depth care etc. ; and c) motives regarding understanding and attention consisting of loss of revel in or understanding approximately medicinal drugs or patient’s condition, and wrong mathematical calculations (20).

Although there are many potential benefits and moral justifications for going into detail on and reviewing nurses' errors, it is difficult to obtain accurate information on correction errors due to nurses' protection from punishment, managerial laws regarding error detection, a lack of the proper reporting and recording device, and a lack of information (21-23). One study conducted in England reported a 15% rate of treatment errors, with nurses responsible for 56% of those errors (24).confirmed that 71% of mistakes have been because of imper- fect prescriptions and 29% have been because of dose calculation of medicinal drugs, and the maximum universal sorts of mistakes have been no administration, inappropriate remedy, and remedy at irrelevant time (25). In Saudi Arabia, a look at through Saudi Patient Safety Center confirmed medicinal mistakes passed off for 16. 7% of the nurses and the maximum not unusual place sorts of medicinal mistakes have been omission of medication and irrelevant dosage (26). Overall, withinside the 1/3 international and growing countries, it's far hard to collect correct estimates because of absence of a right recording and reporting device and absence of studies information, however specialists speculate that the charge of those mistakes is high, and the growing wide variety of proceedings in opposition to fitness care crew in courts and to judicial government additionally confirms this (27). Identifying the sorts of mistakes is step one in the direction of stopping them, and consistent with the findings of this paper, you possibly can face the trouble of drugs mistakes as a nurse or teacher throughout expert activity.

Accordingly, we geared toward accomplishing a look at on remedy mistakes and their reasons if you want to discover the wide variety of recalled devoted remedy mistakes according to nurse over the direction of his/her nursing career, and the charge of drugs mistakes mentioned to nurse managers the usage of incident reviews, withinside the nurses of the emergency department.

2. METHOD

In this descriptive study, 94 nurses of the emergency department of King Fahad Medical City were selected based on census from 30 June, 2010, to 30 June, 2011. This Medical City is the largest educational and therapeutic center in CR2 in Riyadh

which houses more than 1,300 hospital beds and includes four separate hospitals and a common emergency room for those four hospitals. The information and data collection tool were the self-made questionnaire, designed and adapted by the researchers based on literature reviews and scientific articles. (17, 28, 29). A two-part questionnaire was developed as follows: the first part aimed to collect demographic information of nurses (gender, age, educational

level, work shifts, type of employment and years of nursing experience); the second part dealt with the nature and causes of medication errors. In this research, medication error was defined as "any drug administered or prepared in a manner that deviates from the prescription chart, manufacturer's instructions, and hospital policy that can be prevented and could result in patient injury" (30). The formal and content validity of the questionnaire was assessed using previous studies, books and asking 10 members of the Nursing educational to comment on the questionnaire and taking into account their corrective comments. The reliability of the questionnaire was determined by Cronbach's alpha test (r = 0.91). To meet ethical concerns, the researchers explained the purpose of the study to study participants and then assured them that the information would be kept confidential; In addition, the questionnaire was anonymous and participation in the study was optional. Inclusion criteria for nurses in this study were physical and mental health

At least 6 months in the ER and with a bachelor's degree or higher. The study protocol was approved by the Research Officer of King Fahad Medical City. Data analyzes were performed using descriptive statistics (frequency, mean, median and standard deviation) and inferential statistics. SPSS version 16 software (SPSS Inc., Chicago, IL, USA) was used for statistical analysis and P values were less than05 were considered significant.

3. RESULTS

All questionnaires were returned to researchers after completion. The average age of the nurses studied was 27.7 ± 3.4 years and their work experience was 7.3 ± 1.9 years. Of the participants, 59 nurses (62.7%) were married, 82 nurses (87.2%) were women, and 42 nurses (46).8%) had made medication errors in the past year. Most nurses (69.04%) had made medication errors only once, and most (88.3%) had bachelor's degrees, while the remainder had advanced degrees. extension of study participants was 83.4 ± 43 hours per month and 54.2% of nurses had fixed work shifts. The emergency action routine is the method of the case. Fortunately, according to the nurses, in most cases of medication errors, there were no complications (97).5%). The most common types of medication errors involved infusion rate errors, administration of two doses of medication instead of one, and omission of medication. In Table (1) the types of medication errors were given.

Table 1. Types of medication errors

Medication Error Types	Number	Percent
Omission of medicine	6	14.2
Medication at inappropriate time	3	7.14
Mistaken medication	5	11.9
Administration of two doses of medicine instead of one	10	23.8
Giving medicine of a patient to another patient	4	9.5
Wrong infusion rate	14	33.3

The most prevalent causes of medication errors in organizational and human domain is a high patient -to- nurse ratio in the ward, insufficient pharmacological knowledge, fatigue resulted from hard work, and use of abbreviated names (Table 2).

Table 2. Distribution of factors affecting the incidence of medicinal errors

Factors Affecting Medication Errors	Number	Percent
Medical Factors		
Large variety of drugs in the ward	2	4.2
Using abbreviated names	23	48.93
Similarities among drug names	11	23.40
Using some drugs in the rare cases	2	4.20
Different medicinal dosages	9	19.14
Managerial and Human Factors		
Fatigue resulted from hard work	9	19.14
High patient -to- nurse ratio	6	12.76
Insufficient education	2	4.2
insufficient pharmacological knowledge	13	27.65
False medicinal calculations	4	10.63
Illegibility of patients records	7	14.89
Illegibility of physicians' prescriptions	4	8.51

The rate of underreporting of medication errors by nurses was 72.7%. Examples of medication errors reported by nurses are given in the table. There was no statistically significant relationship between demographic information (age, gender, education) and occupational information (type of establishment, work experience, monthly overtime hours) and medication errors by nurses (P> 0/05).

Table 3. Examples of reported medication errors by nurses

- Mistaken infusion rate of nitroglycerine anddopamine - Reconstituting antibiotics in dextrose 5% serum instead of normal saline - Giving nitrocontin tablet instead of warfarin - Giving 80 mg aspirin tablet instead of 325 mg aspirin tablet or vice versa - Preparing 10000 units heparin instead of 5000 units - Intradermal injection of insulin instead of subcutaneous injection - Venous injection of antibiotics such as cefazolin and ceftriaxone instead of venous infusion (microset) - Giving 6.4 mg nitrocontin tablet instead of 2.6 mg tablet

4. DISCUSSION

According to this survey, medication mistakes were committed by 50% of nurses. The percentage of medication mistakes made by nurses in various trials varied from 67% in the Stratton et al. (31) study to 43% in the Lisby et al. (32) study to 42.1% in the Mrayyon et al.(7) study to 10% in the Koohestani et al. study (17). The significant disparity in medical error rates between this study's findings and comparable findings in other nations may be attributable to the unfavorable post-reporting reaction from peers, coaches, and managers (33), the failure to follow up on medication, insufficient systemic registration and notification (;6), the poor physical condition of patients, unfavorable physical conditions, noise, and crowding (34). The findings of this investigation revealed that inappropriate infusion rates were linked to the most frequent mistakes. And the administration of two doses of medication instead of one. In a study in Jordan, the most common types of medication errors were wrong patient and wrong dose (35). In a study on the frequency of medication errors among the nurses, Nikpima et al. concluded that the most common medication errors were incorrect dosing, medication omission, and medication administration at inappropriate times (6). Cheraghie et al.Detected 64 care medication errors, including incorrect infusion rates (44%), incorrect dosing (23%) and incorrect administration times (12%) (21).

According to our findings, administrative and human factors associated with medication errors included lack of nursing staff, insufficient pharmacological knowledge, and fatigue from heavy workloads. Hosseinzadeh et al. suggested that the most important reasons for medication errors are understaffing, burnout in nursing and heavy workload (36). Al-Shara found that many medication errors were due to a heavy workload (41.4%) and new employees (20).6%) (35). In contrast, Stratton et al. reported that only 5% of nurses considered lack of knowledge to be an effective factor in the incidence of medication errors (31). In a study in the United States, 42% of nurses reported that there was no factor that caused their error, while 23.6% cited nurses' carelessness and distraction, and 11.3% cited long working hours as a factor causing medication errors (30). Functions outside the nursing role of nurses and a lack of awareness led to work errors in nursing (37). The caregiver's lack of diligence in executing medication prescriptions is a very important issue that is influenced by various factors such as: B. Fatigue from heavy workload. It appears that changes in nurse working conditions are needed to reduce human error (16). Insufficient professional training and insufficient knowledge of graduates are cited in various studies as causes of medication errors (38). .The results of this study indicated that the use of abbreviated names and similarities in drug names were among the medical factors associated with medication errors. Micro et al.studied the medication prescribing process in medical wards for two years and mentioned that the most common causes of medication errors were illegibility of medication orders in

medical records (13.3%), medication preparation errors (30%) and medication prescribing errors (28.3%) (40). All of these errors are related to pharmacological information, and many nursing researchers mention improving the pharmacological knowledge of nurses as a serious strategy to reduce medication errors, and conclude that updating the information of nurses and nursing students is about medicines and in particular new medicines can be an important factor in reducing medication errors (41).

Although the dangers connected with medications and their adverse effects are not only present in the nursing staff, a lack of pharmacological expertise is one of the main causes of medication errors (42). Many flaws can also be found in the prescription writing, distribution, and execution processes. 72.7 percent of the nurses in this study failed to disclose these mistakes. Nurses made more more prescription errors than they reported, but the reporting rate was substantially lower. 42.1% of nurses in Jordan, according to a research by Mrayyan et al., had at least one prescription error throughout their career (7).In other studies, the number of medication errors reported by nurses was lower than the true number (43). While the discrepancy between the number of medication errors committed in the ED and their reporting rate is desirable for the authorities, it can be quite troubling for the therapeutic system. Reporting medication errors can prevent potential harm to patients and is also considered a valuable source of information to help prevent similar medication errors in the future. The primary motivation for reporting medication errors should be to protect patient health and safety. patients and the prevention of possible adverse drug effects in hospitalized patients (17). It is clear that the low rate of medication errors is desirable for the authorities, but it should be noted that minimizing the gap between errors and their reporting should also be considered a major concern. Studies show that medication errors are one of the main problems in the healthcare system, and more importantly, preventing these errors depends on their accurate reporting (37).

These reports may also be used to improve management of pharmaceutical errors and stop them from happening in the future. It should be noted that CEOs and trainers shouldn't punish caregivers for the unfavourable outcomes of these reports; instead, they should work to eliminate obstacles to reporting and, to the extent possible, ethically and legally make up for the harms and unfavourable outcomes of care that the reports have brought about (44). To do this, nurses should be encouraged to report medication errors with consideration for the benefit to the patient, i.e., to execute an ethical job in order to maximise utility, based on the notion of honesty as a virtue based on Aristotle's Teachings (45).

Although the confidentiality of the demographics and information was ensured and all identifiable data such as first and last name were removed, participants may have provided incorrect answers to the questions for fear of disclosure, which can be considered a limitation of our study.

5. CONCLUSION

We conclude that medication errors are common in the ED but seldom result in adverse events. Most medication errors occur during the prescribing and administering phase of the medication use process. Boarded patient status, an increasing number of medications ordered or administered, and part-time nursing status are associated with an increased risk of medication error. Further research is needed to be able to generalize these findings to other ED settings. Knowledge of effective recovery strategies can ultimately be used to develop interventions for reducing medical error and improving patient safety

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