

DRUG PRESCRIPTION ERRORS AND PREVENTION TECHNIQUES FROM THE PERSPECTIVE OF NURSES, PHARMACISTS, AND NURSING STUDENTS

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ABSTRACT

Medication mistakes are among the most frequent medical errors that have the potential to endanger patient safety and even result in fatalities. This study's objective was to investigate the factors that contribute to medication errors as well as preventative measures from the perspective of nurses and nursing trainees. A cross-sectional descriptive survey of 327 EMZOR pharmacy employees was conducted 2015 saw the enrollment of 62 nursing trainees at the School of Nursing in the Nigeria. Data was gathered from a trustworthy and valid questionnaire. Using the SPSS 16 program, descriptive statistics, t-tests, and ANOVA were used to evaluate the data. The analysis revealed that (97.8%) fatigue brought on by a heavy workload and (77.4%) medication calculation were the most frequent reasons of prescription errors in nursing care. According to nurses and nursing students, reducing work pressure by a proportional increase in staff to the quantity and status of patients and also creating a unit as Medicine bill was the more crucial method for prevention. Based on the findings, it is advised that nursing managers address the staffing issue and provide workshops and on-the-job training about medication preparation, side effects, and pharmacological information. Use Electronics Medications Cards as a measurement of reduced medication mistakes.

Keywords: Drugs Mistakes, Nurse, Nursing Students, Prevention, and Strategies.

Introduction

The use of drugs is a result of certain health issues, such as obesity, cardiovascular disease, cancer, addiction, and diabetes, which are linked to lifestyle shifts. (Arbabisarjou, Robabi, 2015). The most frequent medical mistakes are medication errors, which can happen as a result of inappropriate drug use at any stage of patient drug prescription (Azikey, 2020; Wolf & Hicks, 2016). Every avoidable step of the therapy process can involve a medical error, such as prescribing the incorrect medication. (Ugwu, 2022). One of the most crucial, intricate, and essential aspects of care is the administration of medications, which calls for the proper training and response from caretakers. Implementing medication prescriptions is seen as an essential part of the caregiver's role and is important to the patient's treatment and care process, with patient safety being of special concern (Soozani & Bagheri, 2017). According to studies, 7,000 of the 44,000 to 98,000

fatalities attributed to medical mistakes involved medication blunders.

According to Hughes and Ortiz's 2015 research, 30 percent of patients who experience medical malpractice pass away or experience long-term disability. (Hughes & Ortiz, 2015). In reality, nurses and nursing students in hospitals are the people directly involved in administering medication to patients and are known to be the people most likely to make medication errors (Clifton-Koeppel, 2008). The majority of the time that nurses spend in hospitals is spent giving people medication. (Demehin & Babalola, 2018). Consequently, in order to prevent potential risks, nurses and nursing students need to have the required knowledge about medications. (Koohestani & Baghcheghi, 2018).

Common medication mistakes made when prescribing drugs include concentration errors, failing to give the medication at the appropriate time, taking too much of it, and failing to administer it properly. (Woods &

Doan - Johnson, 2012). While medication mistakes are common among nurses and nursing students, research has shown that they underreport these errors (Azike, 2021). The reported incidence of medication errors among nursing students was 48.5%, with forgetting to prescribe medication being the most frequent variety. (McCarthy & Kelly, 2017). Missing drug information, inaccurate drug calculations, disregard for established procedures, similar drug forms and choices, similar drug names, and sloppy handwriting by doctors can all result in drugs. (Carlton & Blegen, 2016). Medication errors are multifaceted issues that require multilateral answers in order to be resolved. Risk management, a daily and ongoing diagnostic and intervention program, can help us lower medication mistakes. In order to better understand medication errors from the perspectives of nurses and nursing students, this research looked at their causes and prevention methods.

Method

This descriptive study was carried out cross-sectionally in 2015 to look into the factors that lead to medication errors and how to avoid them from happening from the viewpoint of pharmacists and nursing students. All of the nurses working in the various wards of the three specialist and subspecialty hospitals in Riyadh, as well as the inpatient pharmacists and nursing students at the nursing school of the University of Medical Sciences, were included in the study population. The sample amount included 62 nursing students, inpatient pharmacists, and 327 nurses who worked in various hospital wards. Sampling was easy and readily accessible. (simple non-random). Senior nursing students were needed to pass the pharmacology course, and inclusion criteria for nurses included having at least a year of work experience in the current ward and possessing at least a bachelor's degree in nursing. A three-part questionnaire that the researcher created served as the data gathering tool. After ensuring the validity and reliability of the

assessment, it was used. Ten educators, nurse educators, and a statistics advisor established the questionnaire's face and content validity. Small changes to the questionnaire were made after gathering these people's views. The validity of the questionnaire was approved, and the test-retest technique was used to confirm the reliability of the questionnaire. The correlation coefficients between the two rounds answering the questions in nursing students and undergraduate students, respectively, were 89.0 and 91.0. Age, sex, working ward, working shift, work experience, category of employment, and having taken a training course in the administration of drugs were all covered in the first section of the questionnaire. The second section asked 22 questions about medication mistakes from the perspectives of nurses and students, to which they gave YES or NO answers. The final section discussed medication error prevention from the perspectives of nurses and students. The poll sections' unwillingness to cooperate or questionnaires that were left unfinished were the study's exclusion criteria. The purpose of the study and instructions for filling out the questionnaire were first and foremost explained to the survey groups in order to respect ethical considerations in research. Participants were also guaranteed that the information would remain private and that it was not necessary to write their names on the questionnaire. It was optional to participate in the research, and oral approval from sections was required.

The questionnaires were then distributed 16 times during various shifts (morning, afternoon, and evening) between the sections with the consent of hospital and university officials, and after being completed by them, the questionnaires were collected. Frequency, mean, and standard deviation were used as descriptive statistics at the end and t-test and ANOVA were used as analytical statistics to describe the results. SPSS for Windows was used for all research. (Version 16.0 SPSS inc., Evenston, Illinois). This study was carried out following the research council's adoption of the plan and

the Zahedan University of Medical Sciences' Ethics Committee's approval. A 0.05 significance threshold was chosen.

Results

According to the findings, the response percentage for nurses was 100% and was 88.66% to pupils. The nurses were all bachelor's degree holders.

In Table 1, additional demographic information about nurses and pupils is shown.

Table 1. Mean distribution, standard deviation and frequency of demographic information for surveyed nurses and students

Variable		Nurses	Nursing students
		M±SD	M±SD
Age		32±5/4	21/53±0/93
Sex		Frequency	
	man	129	24
	woman	198	38
Ward	internal	118	13
	surgery	54	6
	emergency	56	7
	gynecology	37	-
	ICU	32	-
	pediatrics	30	10
	ALI-EBNE-ABITALEB	154	40
Hospital	KHATAM-AL-ANBIA	137	22
	AL-ZAHRA	36	-
Shift	Fixed	71	-
	Rotatory	256	-
	Official	103	-
Employment	Contractual	87	-
	Agreement	52	-
	Projective	85	-
having a training course in the field of giving drug	Have	152	-
	Don't have	175	-
Job experience		M±SD	-
		9/63±1/78	-

According to nurses, factors that contributed most to medication errors in nursing included a high workload, a high number of severely ill patients, doctor's orders that were illegible or damaged, a low nurse-to-patient ratio, and distracting environmental factors. Table 2 lists additional elements that influence the frequency of medication errors

Table 2. Nurses views point on the influencing factors of medication errors in 2015

Cause (view point)	YES (%) number	NO (%) number
Fatigue due to high workload	320(97.8)	7(2.1)
the large number of critically ill patients	294(89.9)	33(10)
doctor's damaged and unreadable orders	290(88.6)	37(11.31)
the low ratio of nurses to patients	242(74)	85(25.9)
environmental conditions lead to distraction (Noise, heavy traffic)	228(69.7)	99(30.2)

Independent t-test results indicated that there was no substantial association between gender and medication errors ($p=0.08$). Additionally, the analysis of variance revealed a significant correlation between the type of employment ($p=0.003$), category of ward ($p=0.019$), and working shift ($p=0.012$) with the mean number of medication errors committed by nurses. Consequently, internal ward nurses and projective nurses reported

the greatest rates of medication errors among nurses working rotatory shifts. According to the students, the biggest contributors to medication errors are incorrect drug calculations, a lack of pharmacological knowledge, and doctors' illegible or damaged orders on medication cards. Table 3 lists additional elements that influence the likelihood of medication errors from the perspective of the learner.

Table 3. Nursing students' viewpoints about influencing factors of medication errors in 2015

Cause (view point)	YES (%)	
	number	number
Wrong medication calculation	28(77/4)	14(22/6)
Lack of pharmacological information	47(75/8)	15(24/2)
doctor's damaged and unreadable orders on medicine cards	45(72/6)	17(27/4)
environmental conditions lead to distraction (Noise, heavy traffic)	41(66/1)	21(33/9)
Stress in emergency situations	39(62/9)	23(37/1)
Lack of attention to the dose of a drug on the medicine card	38(61/3)	24(38/7)
To do oral statements without checking the medicine card	35(56/5)	27(43/5)
Similarity in the name of drugs and reading the wrong name from the medicine Card	34(54/8)	28(45/2)
Similarity in the drugs shape and lack of attention to the label of drugs	33(53/2)	29(46/8)
Different routine of wards in the concentration of infusion drugs	32(51/6)	30(48/4)
Failure to follow the process of infusion after injection	31(50)	31(50)
The use of acronyms instead of full name of drugs	31(50)	31(50)
Entering wrong drug in the medicine card	30(48/4)	32(51/6)
Similarity in the category of drugs	26(41/9)	36(58/1)
high workload	25(40/3)	37(59/7)

Cause (view point)	YES (%)		NO (%)
	number	number	
Not paying attention to the PRN order	23(37/1)	39(62/9)	
Poor physical environment (light, temperature)	22(35/5)	40(64/5)	
Poor clinical skills	21(33/9)	41(66/1)	
Lack of familiarity with the drug injection equipment's	20(32/3)	42(67/7)	
Prescription of drugs without medical supervision	19(30/6)	43(69/4)	
Not following-up the treatment methods	18(29)	44(71)	
Working in an educational hospital	15(24/2)	47(75/8)	

According to independent t-test there was a significant link between gender and medication errors among students ($p=0.63$). Additionally, a substantial correlation between the ward and the incidence of medication errors among students was revealed by the ANOVA test ($p=0.03$). the

internal section was where the majority of mistakes were made. According to nurses, the best way to prevent and control medication errors is to lower workload demands and hire more staff members in proportion to the number of patients. From the perspective of nursing students, the best way to prevent and

control medication errors is to designate a section of the curriculum specifically for practicing and perfecting the skills required to calculate the proper dosage of medications.

Table 4 lists additional measures to avoid medication errors in various survey categories.

Table 4. Methods of prevention of medication errors by nurses and nursing students in University of Nigeria Medical Sciences in 2015

Nurse's & Pharmacist's viewpoint	
reduce working pressure by increasing the number of staff proportional to the number and condition of patients	98/16%
Education and improve nurses' knowledge about drugs and proper medicine prescribing and medication with principles and techniques	91/13%
Availability of the necessary information about drugs, side effects and interactions in the wards	84/70%
Using infusion pumps in wards in order to avoid rapid infusion of dangerous drugs	78/59%
Improve the working environment such as lighting, temperature, humidity, noise, controlling the number of patients, the movement of the patient accompanying	70/94%
Inform and educate nurses about new drugs	64/52%
Choosing nurses for different wards according to their interests	61/46%
Paying attention to medication error reports as an opportunity to learn in order to prevent their recurrence	57/18%
Nursing student's viewpoint	
create a section as medication calculation to practice and improve the skills needed for calculating right dosage of the drugs	96/77%
Availability of pharmacological books and access to sites related to pharmacological information in the wards and holding periodical pharmacological congresses	93/54%
Awareness on the correct principles of giving drug, such as identifying the correct patient, correct drug, correct dosage, correct time and routine of the ward	80/64%
The use of electronic medical cards for the correct reading of medication orders by students	66/12%
Positive reaction of nurse educators toward reporting medication errors for better management of errors	56/45%

Discussion

The findings of this research have demonstrated that fatigue brought on by heavy workload, the large number of critically ill patients, the unclear or broken orders from doctors, and the low nurse-to-patient ratio are the most important variables that will have an impact on medication errors in nurses. According to Hosseinzade et al. (2012), nursing staff deficiencies, fatigue brought on by a heavy workload, and a heavy workload within the wards were the main reasons of medication mistakes in nurses. (Hosseinzadeh & Aghajari, 2012). Low staffing levels were cited as the primary cause of medical errors in an extensive research by Blendon et al. (Blendon & DesRoche, 2002). Tang's research also revealed that fewer workers resulted in lower

labor standards and more medication mistakes. (Tang & Sheu, 2007). According to this research, medication errors were primarily driven by fatigue brought on by heavy workloads. However, physical or mental fatigue was listed as the third reason for medication errors in NikPeyma's research. (Nikpeyma & Gholamnejad, 2009).

However, studies show that one of the most common reasons for medication mistakes is fatigue brought on by a heavy workload. According to study findings, nurses are more likely to make certain medication errors than doctors, such as injecting drugs too quickly when they should be done carefully or failing to pay attention to drugs that need more care than others. (Yaghoobi et al., 2015). The most significant factor behind medication

errors is fatigue as a result of high work, according to a research by Howe et al. (2005) that examined some of the most common medication errors. (Haw & Dickens, 2005). Exhaustion develops as a result of the chronic feeling of pressure brought on by heavy lifting. (Arbabisarjou et al., 2015). According to research, fatigue is the third most common reason for medication mistakes. They held that medication errors would be caused by extended working hours, heavy workloads, increased environmental stimulations like noise, and improper lighting in the workplace. They contend that the numerous, intricate, and concurrently required roles and responsibilities of nurses may lead to a rise in medication errors. (Pape & Guerra, 2005). According to a different research, nurses' high workload and their unfamiliarity with the patient's condition were the two most significant contributing factors to medication errors. (Al-Shara, 2011).

According to the study's findings, it is evident that a variety of variables contribute to medication errors, and that human error is unavoidable. (Wolf & Hicks, 2006). However, proper planning and an observation and care system will reduce errors and halt the negative effects of errors as they happen. In addition to raising prices, medication errors make patients and their families distrust the healthcare system. This negative effect is related to a variety of various factors, such as a lack of knowledge and information and disregard for the standards for drug prescription. (American Society of Hospital Pharmacists 1993). The findings of the study clearly show that the most typical medication mistakes made by students are incorrect medicative calculations, a lack of pharmacological knowledge, and an inability to understand patient records. (Gorgich et al., 2014) regarding the nurses' reading objective on how to avoid medication mistakes The findings indicated that the most effective way to prevent this error is to lower work pressure by increasing the number of workers in proportion to the number and status of patients. However, in a different study in this

field, staff training and information about new medications were found to be the most effective methods to prevent medication errors, as opposed to increasing the number of staff in proportion to the number of patients. (Ghasemi & Valizadeh, 2009). The study found that incorrect medication calculations, a lack of pharmacologic knowledge, unclear instructions on medication cards, distractions caused by the environment, and stress brought on by emergency situations were the five factors that had the greatest impact on the prevalence of medication errors in nursing students. In Esmaeil Nejad's research, failure to pay attention to the medication card's dose instructions and entering the incorrect drug were listed as the main causes of medication errors. but the emergency ward had the highest incidence of medication errors. (Nejad & Hojjati, 2010). In the research by Wolf and colleagues, inadequate clinical performance, failing to adhere to treatment plans, and a lack of pharmacologic knowledge among students were the three most prevalent causes of medication errors in students. (Wolf & Hicks, 2006).

Lack of pharmacological knowledge, failing to pay attention to the amount of medication listed on the medication card, and incorrect medication calculation were found to be the most prevalent causes of medication errors prevalence in a study by Kouhestani (Kouhestani & Baghcheghi, 2008), which is fully consistent with the findings of this study regarding the causes of medication errors in students. They came to the conclusion that increasing drug knowledge during college and in the workplace would be helpful in lowering the incidence of medication mistakes. Healthcare providers must identify the root causes of errors in order to discover solutions, reduce their frequency, and achieve better outcomes for improving the situation. Effective pharmacologic management could be a nursing job that integrates technical expertise, scientific knowledge, and compliance-supporting practices. (Soozani & Bagheri, 2007).

Conclusion

In conclusion, given the growing number of critically ill patients on wards and the need to address the labor shortage proportionate to the patient population, it is important to understand the causes of medication errors and their significance as a gauge of the quality of medical care. Medication errors can also be decreased by familiarizing and educating caretakers on the remarkable procedures for minimizing medication errors and by developing electronic medication records for patients. The following is advised in order to manage and lessen the risk factors for drug errors: a methodical strategy to holding regular pharmacology refresher courses, providing medical knowledge according to student needs, easy access to the Internet for health students to update their pharmacology knowledge, and continuous assessment of students' performance will all lead to improved student function and fewer medication errors. Identify the effective causes of medication errors and try to solve them.

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