KNOWLEDGE AND ATTITUDES OF EMERGENCY NURSES REGARDING MEDICATION ERRORS

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Abstract: *Medication errors in emergency departments can lead to significant patient harm. Understanding the knowledge and attitudes of healthcare professionals regarding these errors is critical for developing effective prevention strategies.* **Objective:** *To assess the knowledge and attitudes of emergency department nurses regarding medication errors.* **Methods:** *A descriptive, cross-sectional study was conducted in the Emergency Department of Sheikh Zayed Hospital, Rahim Yar Khan, from March 2023 to March 2024. A total of 150 nurses participated in the study. Data were collected using a 43-item questionnaire available in both Urdu and English. The questionnaire comprised six sections, focusing on knowledge, attitudes, and behaviors regarding medication errors. Responses were recorded on a Likert scale ranging from 1 (totally disagree) to 5 (totally agree). Statistical analysis included descriptive statistics to summarize the responses.* **Results:** *The mean age of the nurses was 43.6 ± 16.6 years, with 70% being female and 30% male. A majority of nurses agreed that medication errors can be reduced by calculating drug dosages beforehand (76%), using prepackaged drugs from the pharmacy (62%), and utilizing informative brochures and guidebooks (66%). Attitudes towards error reduction were positive, with recommendations for systematic training of healthcare staff (94%), raising awareness about risk management and prevention (90%), evaluating staff for eligibility (90%), and the importance of reporting and assessing errors (94%).* **Conclusion:** *Nurses in the emergency department possess sufficient knowledge and exhibit positive attitudes toward medication errors in the management and administration of IV drugs. However, ongoing training programs and awareness initiatives are essential to update nurses' knowledge and enhance patient safety.*
Keywords: Attitude, Emergency Service, Hospital, Knowledge, Medication Errors, Nurses

Introduction

Health care systems and staff primarily focus on patient comfort and safety, and WHO also emphasizes providing foremost attention to patient care. Nurses are essential in ensuring safety as they are directly involved with most patient care. According to a report, almost 44,000 to 99,000 patients die annually due to errors made by assisting staff. (1). In Pakistan, more than 500,000 people die due to medical errors each year as a result of a lack of training, education, and awareness to handle emergencies. (2).

Medication error is an adverse or undesirable reaction to inadequacy or excess drugs that may put a patient's survival at risk. These errors occur due to wrong prescriptions, mislabeling or mispackaging of the drug, administration of the wrong drug dosage, lack of knowledge about the patient, negligence in patient monitoring, and drug reactions. (3). Medication errors are more common when the drug is administered intravenously than when given orally (4)Health workers are often scared of the repercussions of their negligence, so most cases of error are not reported.

Emergency departments and intensive care units are the frequent places where medication errors occur at an alarming rate due to a shortage of staff, chronic diseases, and limited knowledge. A 4-15% error rate has been reported in the emergency department literature (5, 6)In addition, the pharmacological staff comprises less than half of the healthcare staff recruited in the ED, and little research has been done on dealing with critical situations in the department. This study was conducted to assess the knowledge and attitudes of the emergency department regarding medication errors.

Methodology

A descriptive, cross-sectional study was conducted in the Emergency Department of Sheikh Zayed Hospital, Rahim Yar Khan, from March 2023 to March 2024. A total of 150 nurses were included in the study by convenience sampling. Nurses who joined less than six months ago and were on prolonged leave were excluded. All participants provided their informed consent to participate in the study, which was approved by the hospital's ethical board.

Data was collected through a 43-item questionnaire in both Urdu and English filled out by the participants. The questionnaire was pre-tested to check its reliability and validity. The research objective, the purpose of the questionnaire, and its contents were explained in detail at the start of the survey. The responses to the test were anonymous to avoid bias. The questions were divided into six sections. The 1st section included demographic details. The 2nd section contained information about the professional, educational profile, work experience, and IV therapy training. The 3rd section inquired about access to bibliographic updates. The 4th section inquired about knowledge regarding drugs in critical care and emergency care departments. The 5th section assessed attitudes regarding the use of IV drugs. The 6th section evaluated the behaviors of nurses regarding IV drug use. The participants could fill out the questionnaire by selecting answers on the Likert scale from 1-5, with one being disagreed and five being agreed.

All the data was assessed using SPSS version 20. Data was presented as frequency and percentage. Univariate analysis was performed for categorical factors using the Chi-square test and for continuous factors using the T-test and Mann-Whitney U test. A p-value less than 0.001 was significant.

Results

The mean age of nurses was 43.6 ± 16.6 years, with 70% females and 30% males. 78% of participants were proficient in English, and 35.3% were recruited without a university degree. Therefore, nurses with university degrees spent significantly more time updating their research knowledge than those without degrees (P=0.001). Similarly, nurses with good English skills spent more than on research studies (P<0.001). A significant association between university degrees and English proficiency was noted (P<0.001). The demographic and professional data of participants is shown in Table I.

The nurses agreed that medication errors could be reduced by calculating drug dosage beforehand (76%), computerized entry of drug prescriptions (44%), use of prepackaged drugs from the pharmacy (62%), informative brochures and guidebooks (66%), and guidance from pharmacist during drug administration (48%) (Table II).

Regarding participants' attitudes, it is recommended to reduce errors by systematic training of health care staff (94%), raising awareness regarding risk management and prevention (90%), guiding and motivating staff to improve patient experience (88%), enforcing a protocol for safe drug use (88%), evaluating staff for eligibility (90%), and reporting and assessing errors (94%) (Table III).

Nearly all the nurses (94%) consider it essential to wash hands before treating a patient, cross-check the patient's details before drug administration, and follow the 6R rule to avoid errors (Table IV).

Table I: Patients' demographic characteristics

Characteristics	N (%)
Age	
Younger than 30	30 (20%)
30-50 years	75 (50%)
>50	45 (30%)
Gender	
Men	45 (30%)
Women	105 (70%)
Education	
Masters	7 (4.7%)
Bachelor's degree	90 (60%)
No degree	53 (35.3%)
Work experience	
1-5 years	33 (22%)
6-10 years	42 (28%)
More than 10	75 (50%)
Studied about IV drugs and their administration	141 (94%)
English proficiency	
Poor	33 (22%)
Moderate	90 (60%)
Excellent	27 (18%)
Access to internet	147 (98%)
Access to library	96 (64%)
Hours per week used for research study	
<1	99 (66%)
1-5	48 (32%)
6-10	3 (2%)

Table II: Knowledge regarding IV drug use

	Disagree/ Mildly agree	Neutral	Agree/ agree
Calculation of IV dosage reduces the chances of errors	6 (4%)	30 (20%)	114 (76%)
Computerized entry of drug prescriptions in the system reduces errors	12 (8%)	51 (34%)	66 (44%)
The use of prepackaged drugs from pharmacy reduces medication errors	24 (16%)	33 (22%)	93 (62%)
Informative brochures and guidebooks decrease the risk of errors	12 (8%)	39 (26%)	99 (66%)

Guidance from pharmacists during drug administration reduces the risk of error	45 (30%)	33 (22%)	72 (48%)
Emergencies in the department divert attention from correct drug administration	15 (10%)	39 (26%)	96 (64%)
Increased workload increases error risk	3 (2%)	23 (15.3%)	124 (82.7%)

Table III: Attitude regarding IV drug use

	Agree	Neutral	Disagree
Training on the management and administration of IV drugs reduces errors	141 (94%)	9 (6%)	-
Awareness regarding prevention and risk management would reduce errors	135 (90%)	13 (8%)	3 (2%)
Guidance and motivation during patient treatment would improve professional performance	132 (88%)	15 (10%)	3 (2%)
Authoritative protocol backed by scientific evidence is necessary for safe management of IV drugs	132 (88%)	15 (10%)	3 (2%)
Guidelines and definitive procedures influence professionalism	132 (88%)	15 (10%)	3 (2%)
Staff should be evaluated for clinical skills	135 (90%)	13 (8%)	2 (2%)
Errors must be reported and assessed for improvement in outcomes	141 (94%)	9 (6%)	-
Training courses can help reduce errors	81 (54%)	66 (44%)	3 (2%)

Table IV: Behavior regarding IV drug use

	Disagree/ disagree	Neutral	Agree/ agree
Washing hands is a necessary practice before drug administration	-	9 (6%)	141 (94%)
Vital signs should be checked before administration of vasoactive drugs.	-	15 (10%)	135 (90%)
The infusion speed of IV drugs should be observed to reduce errors.	-	6 (4%)	144 (96%)
The 6R rule must be followed to reduce errors.	-	9 (6%)	141 (94%)
Drug prescription, preparation, and administration information must be checked before administration.	-	9 (6%)	141 (94%)

Discussion

This study was conducted to assess the knowledge and attitudes of nurses regarding medication errors. The results revealed a high knowledge among healthcare staff regarding IV drug administration. They recommended that changes in clinical practices and organizational policies can contribute to a reduction in medication errors. These findings are consistent with other studies. (7-9).

76% of nurses agreed that medication errors can be reduced by calculating drug dosage beforehand. Manias et al. also

reported 77% agreement of nurses on this (10). Wright et al. also report the need for nurses' knowledge regarding drug calculation by dividing drug administration into two phases to reduce medication errors (11). Older nurses with more experience were better at calculus knowledge than younger ones. However, a study by Finnish researchers shows that younger minds are better equipped and prepared than older colleagues regarding calculus knowledge (12).

44% of the population agreed that computerized entry of drug prescriptions is a way to reduce MEs. Studies have advocated the use of online data entry systems that help manage erroneous management of patient treatment (13, 14). However, it is necessary to design a system that is aware to nurses and matches the departments' workflow as a complex can be a new source of errors. Therefore, a new technology must be followed by a training program. The use of prepackaged drugs from the pharmacy can reduce MEs, as 62% of participants agreed. Roman et al. and Ahtiainen et al. reported this recommendation in their study (15, 16).

94% of nurses agreed that reporting errors reduces MEs and improves the quality of care. Biresaw et al.(17) It was reported that the error signaling system limits the repetition of errors and ensures patient safety. However, in Pakistan, no monitoring tool or system is implemented due to a lack of research and cultural factors.

Our study has reported ways of reducing errors as reported by literature, i.e., the introduction of organizational policies, computerized entry of patients' data, use of prepackaged drug dosages by pharmacy, awareness through guidebooks and brochures, and pharmacist guidance during drug administration. (3, 18, 19).

The primary cause recognized in our study is the nurses' lack of education and research. Insufficient knowledge may not be a source of learning new skills, and thus, errors may occur during drug administration. Only 68% of participants had a university degree, and they, too, learned limited knowledge about pharmacology in their course. Other studies have also reported the system error that inadequate pharmacological courses were included in undergraduate studies, deeming students ineligible to handle drug administration accurately. (20, 21). In our study, only 54% supported the introduction of training courses to reduce errors. However, this perspective can be changed by awareness and motivation. Although 98% of staff had access to the internet, only 34% spent more than 1 hour on bibliographic updates.

Our study has some limitations. Our study design limits the possibility of comparing study results with sample features, which could have led to more profound knowledge about healthcare staff to improve and achieve quality healthcare services. Secondly, due to the absence of a pharmacovigilance company in Pakistan, we could not assess the applicability of our questionnaires to other drug monitoring systems.

Conclusion

The emergency department nurses have sufficient knowledge and positive attitudes about medication errors that occur during the management and administration of IV drugs. However, training programs and awareness are necessary to update nurses' expertise and ensure patients' safety.

Declarations

Data Availability statement
All data generated or analyzed during the study are included in the manuscript.
Ethics approval and consent to participate.
Approved by the department Concerned. (IRB-SKZH-RYK-336 dated 12-01-23)
Consent for publication
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Conflict of interest

The authors declared an absence of conflict of interest.

Authors Contribution

Akash Naeem (Charge Nurse)
Final Approval of version & Design of Study
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Revisiting Critically & Drafting & Concept
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Data Analysis

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