

ASSESSING NURSES' UNDERSTANDING AND IMPLICATION BEHAVIOR REGARDING MEDICATION ERRORS: IMPLICATIONS FOR PATIENT SAFETY IN TERTIARY HOSPITALS

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ABSTRACT

Background: Medication errors are a common problem in healthcare and can adversely affect patient health and safety. These errors may occur at any stage of the medication process, including prescribing, dispensing, administration, and monitoring, often resulting in adverse drug events. The high frequency of such errors highlights the importance of well-trained nurses, as strong awareness of drug administration enables them to play a key role in ensuring patient safety and improving the quality of care.

Aims: To assess the nurses' awareness and practices regarding medication errors in tertiary care hospitals.

Methodology: A descriptive cross-sectional study was conducted among nurses belongs to different public sector hospitals within time frame of six months. A total 200 nurses were participated, selected through random sampling technique from those who were willing to give written consent and working on bedside. The nursing interneers and nurses on the administrative positions and not working on bedside were excluded. The data was analyzed on the SPSS version 23.0 by using percentage, mean and standard deviation, t-test, ANOVA and chi square were applied with p -value < 0.05 .

Result: Among the 200 nurses, the majority were male (56%) and belonged to the 30–39 years age group (44%). Most participants held a Post RN BSN qualification (57.5%) and had more than 10 years of clinical experience (31.5%). In addition, 87% had not received any formal training on medication errors. The findings revealed that nurses demonstrated slightly higher total practice scores (Mean = 36.21, SD = 3.68) compared to total knowledge scores (Mean = 34.71, SD = 7.23) related to medication error management.

Conclusion: The study concluded that most nurses possessed adequate practice related to medication errors management although the knowledge level was lower. Additionally, a large portion of nurses had not received formal training on medication errors, indicating a significant educational gap.

Hence, continuous educational programs are required to enhance nurses' knowledge and promote patient safety.

Keywords: Nurses, Medication Error, Patient Safety

INTRODUCTION

Healthcare administration is universally recognized as a primary responsibility of healthcare providers, who must ensure the delivery of high-quality care to all patients¹. In every healthcare setting, a large number of medications are administered to patients each day, making medication errors one of the most common challenges in the medication administration process². These mistakes can happen during any stage of medication process include wrong dosage, using incorrect route or method of administration or giving medication to wrong patient³. However, a research reveal that despite established protocols, medication errors remain prevalent, often due to factors such as poor communication, high workload, insufficient staffing, interruptions during drug administration, and lack of continuing education⁴. The National Coordinating Council for Medication Error Reporting and Prevention defines a medication error as an avoidable occurrence that could result in inappropriate medication use or harm to the patient, whether it happens while the medication is under the control of a healthcare provider⁵. Medication administration errors are a common and well-recognized issue in healthcare. A Study show that error rates may range from 1.6% to 20% of all medication administrations. Moreover Medication administration error (MAE) is a leading issue in all health settings around the world⁶. There are various types of MAE such as wrong dose, wrong route, wrong time, wrong medicine and administration of medication to the wrong patient⁷. Furthermore a study have shown that medication errors are associated with nurses inadequate knowledge, poor practice, and carelessness⁸. Furthermore a study of Saudi Arabia reported 60.4% and 34.0% prevalence of medication errors among the physicians and nurses respectively in the hospitals⁹. A research identified that nurses have limited time for

medication administration and frequently face interruptions caused by healthcare staff, phone calls, system failures, and difficulty accessing equipment¹⁰. These errors can cause direct harm to patients, increase healthcare costs, and negatively affect healthcare workers both personally and professionally, leading to reduced performance and lower self-esteem¹¹. Additionally each year, up to 500,000 people, including women and children, die in Pakistan as a result of medication errors such as incorrect prescriptions, drug overdoses, self-medication, and adverse drug effects¹². Nurses' awareness and adherence to safe medication practices are essential for minimizing adverse drug events and ensuring quality care. In tertiary care hospitals, the complexity of patient care increases the likelihood of medication errors among nurses, who play a vital role in medication administration and overall patient care¹³. Medication administration errors are preventable events that may lead to inappropriate medication use or patient harm while the medication is under the control of healthcare providers. Therefore, this research was conducted to evaluate nurses' awareness and practices related to medication errors in public tertiary care hospitals.

Hypothesis

Null hypothesis: There is no significant relationship between nurses' awareness and practices regarding medication errors.

Alternate Hypothesis: There is a significant relationship between nurses' awareness and practices regarding medication errors.

Methodology

A descriptive cross-sectional study was carried out among nurses working in selected tertiary care public hospitals of Larkana, including Chandka Medical Center Hospital, Shaikh Zaid Hospital, Civil Hospital, and the National

Institute of Cardiovascular Diseases (NICVD), over a period of six months. The study population consisted of registered nurses with a minimum of six months of clinical experience who were directly involved in patient care and agreed to participate. Nurses who were unwilling to participate, nursing interns, students, and those serving in administrative positions were excluded from the study. A total sample of 200 nurses was determined using a 95% confidence level in OpenEpi version 23.0. Participants were selected through random sampling from different departments, including medical, surgical, ICU, emergency, and pediatric units. Data were collected by using a structured self-administered

questionnaire adapted from validated studies and pretested for reliability and clarity (e.g., Alomari et al., 2018; Ahmad et al., 2020)¹⁴, and modified for local relevance. It will be pretested on a small group (5-10%) to check clarity and reliability (Cronbach's alpha ≥ 0.7). Data analysis was performed using SPSS version 23, applying descriptive and inferential statistics, with a p-value of <0.05 considered significant. Ethical approval was obtained prior to the study, and informed consent was secured from all participants. Confidentiality and anonymity of the participants were maintained throughout the research process.

RESULTS

Table 1 Demographic Variables

Demographic	N = 200	%
Gender		
Male	112	56
Female	88	44
Age		
20-29	45	22.5
30-39	88	44
40-49	60	30
Above 50	07	3.5
Educational Qualification		
Diploma in General Nursing	51	25.5
Post RN BSc Nursing	115	57.5
Generic BS Nursing	30	15
Post Graduation	4	2.0
Clinical Experience		
Less than 1 year	13	6.5
1-5 Years	61	30.5
6-10 Years	63	31.5
More than 10 Years	63	31.5
Received training on Medication Safety and Error Prevention		
Yes	26	13
No	174	87

Table 2 T-Test

Group Statistics

	Gender	N	Mean	Std. Deviation	Std. Error Mean
Total Knowledge score	Male	106	33.7264	7.75891	.75361
	Female	94	35.8191	6.44240	.66448

An independent sample t-test was conducted. There was a significant difference in scores between females (Mean=35.8191, SD=6.44240) and males (Means=33.7264, SD=7.75891). The

result is show that gender has a significant effect on Total knowledge scores. Female's scores higher than males.

Table 3 ANOVA

		Sum Squares	df	Mean Square	F	Sig.
Age	Between Groups	13.349	21	.636	1.069	.385
	Within Groups	105.846	178	.595		
	Total	119.195	199			
Years of Clinical Experience:	Between Groups	29.570	21	1.408	1.862	.016
	Within Groups	134.625	178	.756		
	Total	164.195	199			
Educational Qualification:	Between Groups	20.964	21	.998	2.382	.001
	Within Groups	74.591	178	.419		
	Total	95.555	199			

Anova was determined statistically insignificant differences in age $F(21,178)=1.069$, $p=.385$, years of clinical experience $F(21,178)=1.862$, $p=.016$

and educational $F(21,178) = 2.382$, $P = .00$ among the groups.

Table 4 Chi-Square Tests

	Value	Df	Asymptotic Significance (2-sided)
Pearson Chi-Square	733.336 ^a	315	.000
Likelihood Ratio	343.083	315	.133
Linear-by-Linear Association	18.820	1	.000
N of Valid Cases	200		

a. 348 cells (98.9%) have expected count less than 5. The minimum expected count is .01.

The findings showed that there was a statistically significant association between two variables, $X^2(315, N=200)=733.336$, $p=0.000$. This

indicates that participants knowledge levels were significantly related to their practice levels.

Table 5 Descriptive Statistics

	Mean	Std. Deviation	N
Total Knowledge	34.7100	7.22891	200
Total Practice	36.2150	3.68329	200

The findings showed a significant positive correlation between total knowledge and total practice. The average score of practice slightly higher than the knowledge, (Mean 36.2150, SD=3.68329) and (Mean 34.7100, SD = 7.22891) respectively.

DISCUSSION

The primary aim of this study was to assess nurses' awareness and practices regarding medication errors in tertiary care hospitals. The findings revealed that the majority of participants were aged 30–39 years (43.84%)¹⁵. Regarding gender distribution, male participants constituted (56.16%), while female participants represented (43.84%)¹⁶. Comparable findings were reported in a study conducted in Southern Ethiopia, where the majority of participants were aged 25–29 years (34.6%), whereas participants aged above 55 years accounted for only (0.8%)¹⁷. Similarly, a study conducted in Iran reported a predominance of female participants (71.8%) compared to males (28.2%)¹⁸. In contrast, findings from a study conducted in Karachi, Pakistan, showed that male participants represented the majority (57.4%). In terms of professional experience, the present study found that most participants had 6–10 years and more than 10 years of working experience (31.51%). Similar findings were observed in a study conducted in Karachi, Pakistan, where the majority of participants had 6–10 years of professional experience (36.8%)¹⁹. Conversely, a study conducted in Khyber Pakhtunkhwa, Pakistan, reported that most participants had 1–5 years of experience (53.76%) (27). Similarly a study from Karachi also documented that the majority of nurses had 6–10 years of experience (36.8%)²⁰.

Regarding educational qualifications, the majority of participants were Post RN BSN

graduates (57.53%), followed by diploma holders in nursing (25.34%), BSN Generic graduates (15.07%), while a smaller proportion had MSN qualifications (2.05%)¹⁷. A study conducted in Khyber Pakhtunkhwa, Pakistan²⁰, similarly reported that most participants had a BSN Generic qualification (57.30%)²¹. However, findings from Bangladesh indicated that diploma in nursing was the predominant professional qualification among participants (46.5%)²².

With respect to clinical placement, most participants were working in pediatric wards (19.18%), followed by ICU, emergency, and other wards (15.75%), medical wards (9.59%), surgical wards (9.59%), CCU (6.85%), orthopedic wards (4.11%), and neuro and ENT wards (1.37%), while the lowest proportion was observed in chest wards (0.68%)²¹. A study conducted in Dhaka, Bangladesh, reported that the majority of respondents worked in medical wards (36.0%), followed by orthopedic wards (18.4%)²³.

Hospital-wise distribution showed that the majority of participants were serving at Shaikhzaid Hospital (41.10%), followed by CMC (28.08%), Civil Hospital (21.23%), while the fewest participants were from NICVD Larkana (9.59%). Concerning training on medication errors, most participants had not received any formal training (86.99%), whereas only (13.01%) had undergone training. Similar findings were reported in a study conducted in Dhaka, Bangladesh, where the majority of respondents had not received training on medication errors (95.6%), while only (4.4%) had received such training (32%).

Among the barriers contributing to medication errors, high workload was identified as the most common factor (60.5%), followed by lack of training (23.5%) and inadequate pharmacological knowledge (4.5%). These findings suggest the

need for structured educational interventions, continuous professional training, and workload management strategies to reduce medication-related errors and enhance patient safety in tertiary care settings.

LIMITATION

This study had several limitations. The findings cannot be generalized to a larger population due to the small sample size. Participants' responses may have been influenced by reluctance to disclose actual medication errors, which could have affected the accuracy of the data. Additionally, distractive factors during questionnaire completion may have influenced participants' responses.

RECOMMENDATIONS

Regular training sessions and workshops should be organized to enhance nurses' knowledge and skills regarding safe medication practices. Implementation of a double-checking system prior to medication administration is recommended to minimize the risk of errors. Adequate staffing should also be ensured to reduce workload and decrease the likelihood of medication errors. Furthermore, nurses should be encouraged to report medication errors and missed doses and actively participate in quality improvement initiatives to promote patient safety and reduce medication-related errors.

CONCLUSION

The findings of the study revealed a slight variation in knowledge levels between male and female participants; however, no statistically significant differences were observed in relation to age, years of clinical experience, or educational qualification. Moreover, the study demonstrated a significant positive correlation between nurses' knowledge and practice regarding medication errors, indicating that higher levels of knowledge were associated with safer and more effective clinical practices.

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