



A STUDY TO ASSESS THE KNOWLEDGE AND PRACTICES OF HIGH ALERT MEDICATIONS AMONG NURSES WORKING IN INTENSIVE CARE UNIT (ICU), HIGH DEPENDENCY UNIT (HDU) AND CRITICAL CARE UNIT (CCU) IN SELECTED HOSPITALS AT GUWAHATI, ASSAM.

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ABSTRACT

Background and Objectives: High-alert medications (HAMs) are defined as those medications that bear the highest risk of causing significant harm to the patient when used incorrectly due to its serious adverse effect. High-alert medication errors can be due to error in prescription, dispensing, storing, preparation or administration of medications. The aim of the study was to assess the knowledge and practices of nurses regarding high-alert medications. **Method:** A quantitative research approach with descriptive design was adopted. 120 staff nurses were selected by using the purposive sampling technique. The study was conducted in two hospitals in Guwahati, Assam Health City Hospital and Guwahati Neurological Research Centre Hospital Dispur. Demographic performa, self- structured questionnaire and self-reported practice checklist on high-alert medication were used for data collection. **Result:** The results were analysed by using descriptive and inferential statistics. The result of the study revealed that the majority of the participant, 97.5% had adequate knowledge, followed by 96.7% of participants had good practice regarding high-alert medication. The chi square value showed that there is no significant association between the knowledge of high alert medication with socio-demographic variables of nurses and shows a significant association between level of practice on high alert medication in the working area at 0.05 level of significance. The Karls Pearson's correlation analysis shows no significant correlation between knowledge scores and practice scores in this sample. **Conclusion:** From the present study, it is concluded that the majority of the staff nurses had adequate knowledge and had good practice regarding high-alert medication. The staff nurses working area played the vital role. Therefore, with further training on high alert medication they can enhance their knowledge and practice.

Key Words: Assess, Knowledge, Practice, High alert medication, Staff nurses

INTRODUCTION

Medication errors (MEs) are unintended failures in the drug treatment process that can occur during prescription, dispensing, storing, preparation or administration of medications.¹ Medication errors are significant and often preventable healthcare problem. Some medication is known to carry a higher risk of harm than other medications and errors in administration of these medications can cause severe clinical outcomes.² High-alert medications (HAMs) are drugs that bear a heightened risk of causing significant patient harm when they are used in error. Although mistakes may or may not be more common with these drugs, the consequences of an error are clearly more devastating to patients.³ High-alert medications (HAMs) are defined as those medications that bear the highest risk of causing significant patient harm when used incorrectly, either due to their serious adverse events or to a narrow

therapeutic window. Nurses are responsible for administration of HAMs; incorrect administration can have a significant clinical outcome.¹ High-alert medications include high and low frequency medications such as insulin, Intravenous anticoagulants (heparin, warfarin), narcotics, neuromuscular blocking agents, Injectable potassium chloride, Sodium chloride solutions above 0.9%, sedatives and chemotherapy agents. High-alert medications are those that have the potential to cause significant patient harm when administered in error.⁴ This study aimed to assess the level of knowledge of High-alert medications (HAMs) among nurses in selected hospitals of Guwahati.

NEED OF THE STUDY

Alves.B, Andrade.T, Santos.S et.al (2021) conducted a study on Systematic Review: Harm Prevalence Due to Medication Errors Involving High-Alert Medications. 5 papers that fulfilled the criteria were selected from a total of 6244 studies that were analysed after scanning 4 electronic databases. While the rate of medication errors resulting in harm were between 3.8% to 100%. The ultimate consequence of medication errors was death, 0.01% was due to “high alert medication” error out of all the cases of damage. The range of error severity was 1.9% for errors that proved lethal to the patients, 0.1% to 19.2% for moderate errors, and 0.2% to 15.4% for major errors. The errors with the highest rate of harm involved epoprostenol, insulin, and KCL (15%). According to the Institute of Safe Medication Practices, 9 out of the 15 drugs that were included was on the US and Brazil list but lacked adequate scientific evidence of their potential for harm.⁵

While doing a literature review, the researcher has understood that similar studies for Indian settings are very few that have been conducted on nurses. As high-alert medications are important and are hazardous at the same time, proper knowledge regarding high-alert medication can prevent the error, which can lead to a life-threatening situation. As nurses are directly involved in administering medications, any negligence or error during this period can lead nurses to a lawsuit. These studies are important and add value to the awareness of this critical topic and, in turn, benefit the patients and the nurses.

RESEARCH METHODOLOGY

The present study was designed to assess the knowledge and practices of “high alert medication” among nurses working in Intensive Care Unit (ICU), High Dependency Unit (HDU) and Critical Care Unit (CCU) in selected hospitals at Guwahati, Assam.

RESEARCH APPROACH: Quantitative approach

RESEARCH DESIGN: Descriptive design

TARGET POPULATION: Staff nurses working in Intensive Care Unit, High Dependency Unit and Critical Care Unit.

ACCESSIBLE POPULATION: Staff nurses who meet the set criteria and who are available for the research study.

SAMPLE SIZE: 120

SAMPLING TECHNIQUE : Purposive Sampling Technique

THEORETICAL FRAMEWORK: The conceptual framework chosen for this study was Modified Janz and Becker’s Health Belief Model.

SETTING OF THE RESEARCH STUDY: The main study was conducted in two different hospitals i.e. Health City Hospital, Guwahati, Assam and Guwahati Neurological Research Centre Hospital Dispur, Guwahati, Assam.

TOOLS OF DATA COLLECTION:

Research tool and technique are based on the objectives of the study; TOOL I: Demographic variables, TOOL II:

(A) Self-structured questionnaire on high alert medication, TOOL II: (B) Self-reported high alert medication practice checklist was developed to assess the knowledge and practices of high alert medications among nurses. **RESULT**

Analysis of the collected data was done using SPSS version 18 version.

Table 1: Distribution of frequency and percentages of demographic variables of nurses.

n=120

Socio demographic variables	Frequency (f)	Percentage (%)	
Age (in years)	Below 25 years	48	40%
	25 years - 30 years	52	43%
	30 years – 35 years	17	14%
	Above 35 years	3	3%
Gender	Male	10	8%
	Female	110	92%
	Others	0	0%
Educational Qualification	GNM	72	60%
	B.Sc. Nursing	30	25%
	Post Basic B.Sc. Nursing	15	12.5%
	M.Sc. Nursing	3	2.5%
Working Area	Intensive Care Unit (ICU)	60	50%
	Critical Care Unit (CCU)	30	25%
	High Dependency Unit (HDU)	30	25%
Working Experience in the current working area	Below 1 year	38	32%
	Above 1 year -3 years	56	47%
	Above 3 year -5 years	14	11%

	Above 5 years	12	10%
Nurse to patient ratio	1:1	20	17%
	1:2	16	13%
	1:3	70	58%
	1:5	14	12%
Course attended related to High-alert medication (HAMS)	Yes	95	79%
	No	25	21%

Table 1 depicts distribution of frequency and percentages of demographic variables of nurses shows that in age of the nurse’s majority of participants 52 (43%) are between 25 years and 30 years, in gender majority of participants 110 (92%) are female, in educational qualification the majority 72 (60%) have a GNM qualification, in working area half of the participants 60 (50%) works in the Intensive Care Unit (ICU), in working experience in current working area the majority 56 (47%) have 1 to 3 years of experience, in nurse-to-patient ratio the majority 70 (58%) have a 1:3 ratio, in courses related to high-alert medication (HAMS) of nurses the majority 95 (79%) of participants have attended course related to High alert medications (HAMS).

Table 2: Distribution of frequency and percentages of level of knowledge of nurses on “high alert medication”’s
n=120

Criteria measure of knowledge score		
Knowledge category score	Percentage	Frequency
Adequate (11-15)	97.5%	117
Moderate (6-10)	2.5%	3
Inadequate (0-5)	0%	0
Maximum score=15 minimum score=0	100%	120

Table 2 depicts the knowledge score criteria, 97.5% of participants fall into the Adequate category with scores ranging from 11 to 15. Only 2.5% of participants have Moderate knowledge scores, ranging from 6 to 10. No participants are classified under the Inadequate category, with scores ranging from 0 to 5.

Table 3: mean, median, standard deviation, maximum, minimum, range and mean percentage of knowledge of nurses on “high alert medication”’s.

Descriptive statistics	Mean	SD	Median	Maximum	Minimum	Range	Mean %
Knowledge score	12.50	1.15	12.00	15	10	5	83.3
	Maximum= 15 Minimum= 0						

Table 3 depicts the descriptive statistics (mean, median, standard deviation, maximum, minimum, range and mean percentage) for knowledge scores show a mean of 12.50, with a standard deviation of 1.15, indicating some variability in scores. The median score is 12.00, suggesting that half of the participants scored above this value and half below. The maximum score achieved is 15, while the minimum is 10, resulting in a range of 5. The mean percentage score is 83.3%, reflecting the overall level of knowledge among participants.

Table 4: Distribution of frequency and percentages of level of practice of nurses on “high alert medication”’s
n=120

Criteria measure of practice score		
Practice category score	Percentage	Frequency
Good (11-14)	96.7%	116
Average (6-10)	3.3%	4
Poor (0-5)	0%	0
Maximum Score=14 Minimum Score=0	100%	120

Table 4 depicts that the practice score criteria, 96.7% of participants fall into the Good category with scores ranging from 11 to 14. Only 3.3% of participants have Average practice scores, ranging from 6 to 10. No participants are classified under the Poor category, with scores ranging from 0 to 5.

Table 5: mean, median, standard deviation, maximum, minimum, range and mean percentage of practice of nurses on “high alert medication”s.

Descriptive statistics	Mean	Sd	Median	Maximum	Minimum	Range	Mean %
Practice score	13.66	0.86	14.00	14	10	4	97.6
	Maximum= 14 Minimum= 0						

Table 5 depicts the descriptive statistics (mean, median, standard deviation, maximum, minimum, range and mean percentage) for practice scores show a mean of 13.66 with a standard deviation of 0.86, indicating some variability around the average score. The median score is 14.00, suggesting that half of the participants scored above this value and half below. The maximum score achieved is 14, while the minimum is 10, resulting in a range of 4. The mean percentage score is 97.6%, reflecting a high overall level of practice proficiency among participants.

Table 6: Association between the knowledge on “high alert medication” with socio demographic variables
n=120

Demographic variables		n= 120			Association with knowledge score			
		Adequate	Moderate	Inadequate	χ^2 Value	df	Table Value	P Value
Age (in years)	Below 25 years	47	1	0	0.934	3	7.815	0.817 ^{NS}
	25 years - 30 years	50	2	0				
	30 years – 35 years	17	0	0				
	Above 35 years	3	0	0				
Gender	Male	10	0	0	0.280	1	3.841	0.597 ^{NS}
	Female	107	3	0				
	Others	0	0	0				
Educational Qualification	GNM	71	1	0	1.595	3	7.815	0.660 ^{NS}
	B.Sc. Nursing	29	1	0				
	Post Basic B.Sc. Nursing	14	1	0				
	M.Sc. Nursing	3	0	0				
Working Area	Intensive Care Unit (ICU)	57	3	0	3.077	2	5.991	0.215 ^{NS}
	Critical Care Unit (CCU)	30	0	0				
	High Dependency Unit (HDU)	30	0	0				
Working Experience in the current working area	Below 1 year	37	1	0	2.154	3	7.815	0.541 ^{NS}
	Above 1 year -3 years	55	1	0				
	Above 3 year -5 years	14	0	0				
	Above 5 years	11	1	0				
Nurse to patient ratio	1:1	19	1	0	1.319	3	7.815	0.725 ^{NS}
	1:2	16	0	0				
	1:3	68	2	0				
	1:5	14	0	0				
Course attended related to High-alert medication (HAMS)	Yes	92	3	0	0.810	1	3.841	0.368 ^{NS}
	No	25	0	0				

*p <0.05 level of significance

NS-Non significant

Table 6 depicts the association between the knowledge on “high alert medication” with socio demographic variables of nurses were tested using chi square test. Results showed that socio demographic variables such as age, gender, educational qualification, working area, working experience in current working area, nurse-to-patient ratio and course attended related to “high alert medication” s(HAMS) were found statistically non-significant at p<0.05 level of significance.

Table 7: Association between the practice on “high alert medication” with socio demographic variables

n=120

Demographic variables		n= 120			Association with practice score			
		Good	Average	Poor	χ^2 Value	Df	Table Value	P Value
Age (in years)	Below 25 years	48	0	0	5.411	3	7.815	0.144 ^{NS}
	25 years - 30 years	48	4	0				
	30 years – 35 years	17	0	0				
	Above 35 years	3	0	0				
Gender	Male	10	0	0	0.376	1	3.841	0.540 ^{NS}
	Female	106	4	0				
	Others	0	0	0				
Educational Qualification	GNM	68	4	0	2.759	3	7.815	0.430 ^{NS}
	B.Sc. Nursing	30	0	0				
	Post Basic B.Sc. Nursing	15	0	0				
	M.Sc. Nursing	3	0	0				
Working Area	Intensive Care Unit (ICU)	60	0	0	6.207	2	5.991	0.045*
	Critical Care Unit (CCU)	27	3	0				
	High Dependency Unit (HDU)	29	1	0				
Working Experience in the current working area	Below 1 year	37	1	0	1.666	3	7.815	0.644 ^{NS}
	Above 1 year -3 years	53	3	0				
	Above 3 year -5 years	14	0	0				
	Above 5 years	12	0	0				
Nurse to patient ratio	1:1	20	0	0	1.792	3	7.815	0.617 ^{NS}
	1:2	15	1	0				
	1:3	67	3	0				
	1:5	14	0	0				
Course attended related to High-alert medication (HAMS)	Yes	92	3	0	0.044	1	3.841	0.835 ^{NS}
	No	24	1	0				

*p <0.05 level of significance

NS-Non significant

Table 7 depicts the association between the practice on “high alert medication” with socio demographic variables of nurses which was tested using chi square test. Results showed that the chi-square values showed that working area were found statistically significant association with at p<0.05 level of significance. Other socio-demographic variables include age, gender, and educational qualification, working experience in current working area, nurse-to- patient ratio and course attended related to “high alert medication”'s (HAMS) were found statistically non-significant. **Table 8: Correlation coefficient between the knowledge on “high alert medication”'s and practice among nurses**

Karls Pearson's Correlation	Knowledge score	Practice score
Mean	12.50	13.66
SD	1.152	0.865
n	120	
Correlation	0.105	
Table Value	0.179	
P Value	0.252	
Result	No correlation	

Table 8 depicts that the Karls Pearson's correlation analysis between knowledge scores and practice scores shows a correlation coefficient of 0.105, indicating a weak positive relationship between the two variables. The p-value of 0.252 is greater than the significance level (typically 0.05), suggesting that this correlation is not statistically significant. Therefore, there is no significant correlation between knowledge scores and practice scores in this sample.

CONCLUSION

The present study aimed to evaluate the knowledge and practices related to high-alert medications among nurses working in the Critical Care Unit (ICU), High Dependency Unit (HDU), and Critical Care Unit (CCU) in selected hospitals in Guwahati, Assam. The results indicated that the majority of participants (97.5%) had adequate knowledge, while 2.5% had moderate knowledge. In terms of practice, 96.7% of participants exhibited good practices, whereas only 3.3% demonstrated average practices. The association between knowledge with socio demographic variables were non-significant whereas association between practice with socio-demographic variables showed significant with working area. Findings concluded that the majority participants had adequate knowledge and good practice and every few with moderate and average practice.

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