



A STUDY TO DEVELOP AND ASSESS THE EFFECTIVENESS OF AN EDUCATIONAL PACKAGE ON SAFE HANDLING OF HIGH-RISK MEDICATIONS IN TERMS OF KNOWLEDGE, ATTITUDE AND PRACTICE OF STAFF NURSES IN A SELECTED HOSPITAL NEW DELHI

¹ Ms. Blessy Elizabeth Varghese, ² Ms. Giji John, ³ Sr. Alphy

¹ Masters in Nursing, ² Associate Professor, Medical Surgical Nursing department,

³ Associate professor, Psychiatric Mental Health Nursing department

¹ Medical Surgical Nursing department

¹ Holy family College of Nursing, New Delhi, India

Abstract : A study was conducted to develop and assess the effectiveness of an Educational Package on Safe handling of high-risk medications in terms of knowledge, attitude and practice of staff nurses in a selected hospital, New Delhi. The objectives of the study were: to develop an Educational Package on safe handling of high-risk medications in a selected hospital, New Delhi, to assess the effectiveness of the Educational Package among staff nurses on safe handling of high-risk medications in terms of Knowledge, attitude and practice in a selected hospital, New Delhi, to find the association between the pre-test knowledge, attitude and practice of the staff nurses on safe handling of high-risk medications with selected demographic variables in a selected hospital, New Delhi, to find the correlation between the post-test knowledge and practice scores of the staff nurses on safe handling of high-risk medications in a selected hospital, New Delhi, to find the correlation between the post-test knowledge and attitude scores of the staff nurses on safe handling of high-risk medications in a selected hospital, New Delhi. After obtaining the ethical clearance from the ethical committee and formal administrative permission, data collection was done from the Hospital, New Delhi. A total of 50 staffs were selected by using convenient sampling technique. A structured knowledge questionnaire, attitude scale and an observational checklist was used to assess the demographic profile, their knowledge, attitude and practice on safe handling of high-risk medication. The practice level was assessed by using observational method on each high-risk medication administration at the patient bed side in both pre-test and post-test assessment of the staff nurses, an average of 5-10 minutes has taken for the observation of high-risk medication administration by each staff nurse in the intensive care unit of selected hospital. These parameters were assessed then a planned teaching program and a standard operating procedure were given to the selected staffs. After administration, the post-test knowledge, attitude and practice level were assessed. Finding revealed that the mean pre-test knowledge level was 11.64 and standard deviation was 4.5. The mean post-test knowledge level was 17 and standard deviation was 4.1. The mean pre-test attitude level was 45.04 and standard deviation was 7.51. The mean post-test attitude level was 49.84 and standard deviation was 0.4. The mean post-test attitude level (49.84) with t value 4.57 was significant at 0.05 level of significance, the mean pre-test practice level was 14.86 and standard deviation was 1.06. The mean post-test practice level was 16.08 and standard deviation was 0.94. The mean post-test practice level (16.08) with t- value 9.4 was significant at 0.05. Hence the educational package on safe handling of high-risk medications was effective in improving the knowledge, attitude and practice of the staff nurses. There was no association between the demographic profile and knowledge, attitude and practice level of staff nurses. The knowledge and practice level were positively and weakly correlated to each other ($r=0.29$). The knowledge and attitude level were positively and weakly correlated to each other ($r=0.37$).

Index Terms - Effectiveness; Educational package; Knowledge; Attitude; Practice; Safe handling of high-risk medication.

INTRODUCTION

Patient's safety is one of the most important components of health care delivery system, as unsafe care increase costs, reduces efficiency, and directly compromises health outcomes and patient perceptions. Medicines are the most common therapeutic

intervention, ensuring safe medication use and having the processes to improve medication safety should be considered of central importance to countries working towards achieving UHC.¹

A recent systematic review of the prevalence and incidence of prescribing errors with high-risk (high-alert) medications in hospitals included nine studies published between 2008 and 2014. It showed that the prevalence of prescribing errors was highly variable, perhaps because of different definitions of both prescribing errors and high-risk (high-alert) medications, and could be extremely high (ranging from 0.24 to 89.6 errors per 100 prescriptions).²

A recent review identified narcotic agents (particularly opioids) as the high-risk (high alert) medications most often associated with prescribing errors in the hospital setting.

NEED OF THE STUDY

The literature about medication administration frequently focuses on avoiding medication errors. Nurses' clinical reasoning used during medication administration to maintain medication safety receives less attention in the literature. As healthcare professionals, nurses work closely with patients, assessing and intervening to promote medication safety prior to, during and after medication administration.³

Nurse's insufficient knowledge is considered to be one of the most significant factors contributing to medication errors. Most medication errors cause no harm to patients,⁴ but the incorrect administration of high-alert medications may result in serious consequences.⁴

Therefore, in order to improve the knowledge, attitude and practice level of the staff nurses this study was done to develop and assess the effectiveness of the educational package which includes a planned teaching program and a standard operating procedure on safe handling of high-risk medications specifically the concentrated electrolytes (Injection Potassium chloride, Injection Magnesium Sulphate and injection Sodium bicarbonate).

RESEARCH METHODOLOGY

Research methodology is a way to systematically and scientifically solve the research problem. It includes description of the research sample, sampling technique, development and description of tools, data collection procedure, development of the educational package on safe handling of high-risk medications

3.1 Population and Sample

In the view of the problem selected and objectives to be accomplished, Quantitative research approach was adopted for the present study the study aimed to assess the effectiveness of the educational package on safe handling of High-risk medications among staff nurses, the research design was Pre-experimental One group pre-test-post-test design. In this study; the population is the Staff nurses working in ICU, Semi ICU and HDU departments.

3.2 Data and Sources of Data

The researcher makes decision about, where to conduct a study based on the nature of the question and type of information needed to address. The present study was conducted in Holy Family Hospital, New Delhi. The independent variable was the educational package on safe handling of high-risk medications and the dependent variable in the present study was the post-test knowledge, attitude and practice of the staff nurses on safe handling of high-risk medications.

3.3 Theoretical framework

Conceptual framework provides the investigator the guidelines to proceed in attending the objectives of the study based on theory. It is a scientific representation of the steps, activities and outcomes of the study. Ernestine Weidenbach helping art of clinical Nursing theory (1964) is used as a conceptual framework for this study in a modified form. The theory mainly consists of 3 factors that indicate the nurse has a central purpose that helps to direct the prescription for care with in realities of a given situation. The 3 factors of the theory can be explained as following; Central Purpose, Prescription and Realities.

3.4 Statistical tools and econometric models

The reliability of the tool was established by Crohn's Bach Alpha formula. The reliability value (r) for structured knowledge questionnaire was 0.7 and the reliability value for attitude scale and observational checklist was 0.8 and 0.7 which revealed that the tool was highly reliable. The testing of the structured knowledge questionnaire, attitude scale and the observational checklist was done to ensure the clarity of items, practicability and feasibility. After obtaining administrative approval, the structured questionnaire, attitude scale and the observational checklist was administered to 10 staff nurses at Holy Family hospital, New Delhi. Three of the tools were found to be clear, unambiguous and appropriate. Average time taken for subjects to finish answering was 5-10 minutes. According to the objectives and hypothesis of the study and opinion of the experts, it was planned to organize, tabulate, analyze and interpret the data by using both descriptive and inferential statistics. The plan for data analysis was as follows: Frequency and percentage distribution of the demographic characteristics of the subjects, Frequency and percentage distribution of pre-test and post-test level of high-risk medications, Mean, Mean percentage and standard deviation of Pre-test and Post-test knowledge, attitude and practice scores. Paired 't'-test was used to assess the pre-test and post-test knowledge, attitude and practice scores of staff nurses regarding safe handling of high-risk medications. Chi-Square test was used to find association between the pre-test knowledge, attitude and practice scores of staff nurses with selected demographic variables. Pearson's correlation coefficient test was used to find the correlation between the post-test Knowledge and practice and Post-test knowledge and attitude of the staff nurses on safe handling of high-risk medications.

IV. RESULTS AND DISCUSSION

4.1

SECTION I Description of the demographic profile of the subjects

Table 1

Frequency and percentage Distribution of demographic profile of staff nurses regarding safe handling of high-risk medications.

n=50

S.no	Variables	Characteristics	Frequency	Percentage
1.	Age in years	20-25	33	66%
		26-30	16	32%
		31-35	1	2%
		36 and above	0	0%
2.	Department	Cardiac intensive care unit	11	22%
		Critical care unit	25	50%
		High dependency unit	0	0%
		Semi ICU	14	28%
3.	Educational qualification	General nursing and Midwifery	14	28%
		B.Sc. nursing	30	60%
		Post Basic B.Sc. nursing	6	12%
		Others	0	0%
4	Years of Experience	0-2 years	28	56%
		3-4 years	15	30%
		5-6Years	6	12%
		More than 6 years	1	2%

Data in table 1 represents the sample characteristics of the staff nurses working in the departments of selected hospitals, New Delhi. The data shows that out of 50 subjects 33(66%) were in the age group 20-25 years, 16(32%) were between 26-30years and 1(2%) were between the age group of 31-35 years and none of the samples were above 36. The table reveals that majority of the samples were from critical care unit 25(50%), 14 (28%) were from the semi-ICU, then 11(22%) were from cardiac intensive care unit and none of the samples were from the high dependency unit. The table reveals that majority of the subjects had B.Sc. Nursing 30(60%), General and midwifery nursing were 14(28%), post basic B.Sc. nursing were 6(12%). The table reveals that majority of the sample 28(56%) had 0-2years of experience, 15(30%) had 3-4years, 6(12%) had 5-6years of experience and 1(2%) had more than 6 years of experience.

SECTION II

Table 2

Findings related to frequency and percentage distribution of observed high-risk medications in the pre-test practice

n=50

Drug Name	frequency	Percentage
Injection Potassium chloride	30	60%
Injection sodium Bicarbonate	10	20%
Injection Magnesium Sulphate	10	20%

The table 2 shows the frequency and percentage distribution of the observed High-risk medications in the pre-test practice of which shows that majority of the high-risk medication (60%) were Injection potassium chloride, 20% were Injection sodium bicarbonate and 20% were Injection magnesium Sulphate.

Table 3**Findings related to frequency and percentage distribution of observed high-risk medications in the post-test practice****n=50**

Drug Name	frequency	Percentage
Injection Potassium chloride	32	64%
Injection sodium Bicarbonate	8	16%
Injection Magnesium Sulphate	10	20%

The table 3 shows the frequency and percentage distribution of the observed high-risk medications in the post-test practice of which shows that majority of the high-risk medication (64%) were Injection potassium chloride, 16% were Injection sodium bicarbonate and 20% were Injection magnesium Sulphate.

SECTION III**Findings related to pre-test knowledge level of the staff nurses regarding safe handling of high-risk medications****Table 4****Percentage distribution of the pre-test knowledge level of the staff nurses regarding the safe handling of high-risk medications.****n=50**

Level of Knowledge	Frequency Score	Percentage
Good knowledge (18-22)	5	10%
Average knowledge (10-17)	28	56%
Poor knowledge (1-9)	17	34%

The table 4 shows the percentage distribution of the level of knowledge of the staff nurses which shows that majority of the sample (56%) had average knowledge, (34%) had poor knowledge and (10%) had good knowledge in pre-test regarding the safe handling of high-risk medications. This interpreted that the staff nurses had average knowledge regarding safe handling of high-risk medication

Findings related to the pre-test attitude level of the staff nurses regarding safe handling of high-risk medications**Table 5****Frequency distribution of the pre-test attitude level of the staff nurses regarding safe handling of high-risk medications****n=50**

Level of Attitude	Frequency Score	Percentage
Favourable (33-50)	45	90%
Uncertain (17-32)	3	6%
Unfavourable (1-16)	2	4%

Table 5. depicts the frequency and percentage distribution of the level of attitude of staff nurses where majority of the sample 45(90%) had favourable attitude, 3(6%) had uncertain attitude and 2(4%) had Unfavourable attitude in the pre-test regarding safe handling of high-risk medications.

Findings related to the pre-test practice level of the staff nurses regarding safe handling of high-risk medications**Table 6****Frequency distribution of the pre-test Practice level of the staff nurses regarding safe handling of high-risk medications****n=50**

Level of Practice	Frequency Score	Percentage
Good Practice (15-18)	35	70%
Average practice (11-14)	15	30%
Poor practice (1-10)	0	0%

Table 6. depicts the frequency and percentage distribution of the level of Practice of staff nurses where majority of the sample 35(70%) had good practice, 15(30%) had Average practice and 0(0%) had Poor practice in the pre-test regarding safe handling of high-risk medications.

SECTION IV**Findings related to pre-test and post-test knowledge level of the staff nurses regarding safe handling of high-risk medications****Table 7****Frequency and Percentage distribution of the pre-test and post-test knowledge level of the staff nurses regarding the safe handling of high-risk medications****n=50**

Level of knowledge	Pre-test		Post-test	
	Frequency	Percentage	Frequency	Percentage
Good knowledge (18-22)	5	10%	31	62%
Average knowledge (10-17)	28	56%	18	36%
Poor knowledge (1-9)	17	34%	1	2%

Table 7 depicts the gain in the level of knowledge of staff nurses after the interventions where majority of the sample, 31(62%) had good knowledge, 18(36%) had average knowledge and 1(2%) had poor knowledge on safe handling of high-risk medications. Thus, the null hypothesis (H_{01}) was rejected and research hypothesis (H_1) was accepted as there is gain in post-test knowledge level after the intervention.

SECTION V

Findings related to pre-test and post-test knowledge level of the staff nurses regarding safe handling of high-risk medications

Table 8

Frequency and Percentage distribution of the pre-test and post-test knowledge level of the staff nurses regarding the safe handling of high-risk medications

n=50

Level of knowledge	Pre-test		Post-test	
	Frequency	Percentage	Frequency	Percentage
Good knowledge (18-22)	5	10%	31	62%
Average knowledge (10-17)	28	56%	18	36%
Poor knowledge (1-9)	17	34%	1	2%

Table 7 depicts the gain in the level of knowledge of staff nurses after the interventions where majority of the sample, 31(62%) had good knowledge, 18(36%) had average knowledge and 1(2%) had poor knowledge on safe handling of high-risk medications. Thus, the null hypothesis (H_{01}) was rejected and research hypothesis (H_1) was accepted as there is gain in post-test knowledge level after the intervention.

Finding related to pre-test and post-test practice level of the staff nurses regarding safe handling of high-risk medications

Table 9

Frequency and Percentage distribution of the pre-test and post-test Practice level of the staff nurses regarding the safe handling of high-risk medications.

n=50

Level of Practice	Pre-test		Post-test	
	Frequency	Percentage	Frequency	Percentage
Good Practice (15-18)	35	70%	48	96%
Average practice (11-14)	15	30%	2	4%
Poor practice (1-10)	0	0%	0	0%

Table 9 depicts the gain in the level of Practice of staff nurses after the interventions where majority of the sample, 48(96%) had good practice, 2(4%) average practice and 0(0%) had poor practice on safe handling of high-risk medications. Thus, the null hypothesis (H_{01}) was rejected and the research hypothesis (H_1) was accepted, as there is gain in post-test Practice level after the intervention.

SECTION V

Table 10

Findings related to the effectiveness of the educational package on safe handling of high- risk medication
n=50

Tool		Mean	Mean Difference	S. D	Paired t test score	Table value
Knowledge Questionnaire	Pre test	11.64	5.36	4.5	9.83*	2.009
	Post test	17		4.1		
Attitude scale	Pre test	45.04	4.8	7.51	4.57*	
	Post test	49.84		0.4		
Observational checklist	Pre test	14.86	1.22	1.06	9.4*	
	Post test	16.08		0.94		

*'t' 2.009, p<0.05, significant at 0.05 level of significance

The data presented in table 10 shows that the mean post-test knowledge score (17) was higher than the mean pre-test knowledge score (11.64) with a mean difference of 5.36. The data shows that the mean post-test attitude score (49.84) was higher than the mean pre-test attitude score (45.04) with a mean difference of 4.8. The data shows that the mean post-test Practice score (16.08) was higher than the mean pre-test Practice score (14.86) with a mean difference of 1.22 This shows that the educational package on safe handling of high-risk medications was effective in increasing knowledge, attitude and Practice of staff nurse

SECTION VI

Finding related to the association between pretest knowledge, attitude and practice level of the staff nurses on safe handling of high-risk medications with their selected demographic variables.

There was no significant relationship between the pre-test knowledge, Pre-test attitude and pre-test practice scores and the selected demographic variables of the staff nurses working in the ICU of selected hospital, New Delhi. This shows that gain in knowledge, attitude and practice is independent to the age, department, educational qualification and years of experience.

Thus, fail to reject the null hypothesis (H_{02}) as there is no significant association between pre-test knowledge, Pre-test attitude and pre-test practice score and the selected demographic variables.

Table 11

Correlation between the post-test knowledge and practice level of staff nurses regarding the safe handling of high-risk medications.
n=50

Variables	Mean	S. D	'r' Value
Knowledge	17	4.1	0.29*
Practice	16.08	0.94	

*= Positive and weak correlation

It was found that there was a very weak positive correlation (0.29) between the knowledge level and the practice level of staff nurse regarding safe handling of high-risk medications. Thus, null hypothesis was rejected (H_{03}) and the research hypothesis (H_3) was accepted as a weak positive correlation found between the knowledge and practice level of the staff nurses.

Table 12

Correlation between the post-test knowledge and attitude level of staff nurses regarding the safe handling of high-risk medications.

n=50

Variables	Mean	S. D	'r' value
Knowledge	17	4.1	0.37
Attitude	49.84	0.4	

*= Positive and weak correlation

It was found that there was a very weak positive correlation (0.37) between the knowledge level and the attitude level of staff nurse regarding safe handling of high-risk medications. Thus, null hypothesis (H_{04}) was rejected and the research hypothesis (H_4) was accepted as a positive correlation found between the knowledge and attitude level of the staff nurses.

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