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A study to assess knowledge regarding prevention and management of medication error among staff nurses working in ramaiah hospitals, Bangalore

[1]MS. Sushmita Bista, M.Sc. Nursing, Department of Medical Surgical Nursing, Ramaiah Institute of Nursing Education and Research, Bangalore, Karnataka, India.

[2]Mrs Ramya S N, Assistant Professor, Department of Medical Surgical Nursing, Ramaiah Institute of Nursing Education and Research, Bangalore, Karnataka, India.

Corresponding Author: MS. Sushmita Bista, M.Sc. Nursing, Department of Medical Surgical Nursing, Ramaiah Institute of Nursing Education and Research, Bangalore, Karnataka, India.

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Abstract

Background

One of the most important concerns in hospitals is the patient's safety and health. Ensuring that the patient is taking the correct medication has an important in patient's treatment. The most important duties of nurses, is administration of medications which can have undesirable consequences for patients.

Medication errors are preventable. Nurses play an important role in preventing and managing medication error. If nurses have knowledge about how to manage and prevent medication error then they will prevent from any complications (disability, death) to patients.

This, study was carried out in order to check the knowledge of nurses regarding prevention and management of medication error.

Materials and Methods

This study was carried out in Ramaiah Hospitals, Bangalore. A total of 150 nurses were involved using non-probability convenient sampling technique. The conceptual framework was based on the general system theory as postulated by Ludwig Von Bertalanffy (1998). Data was collected using structured questionnaire. Data was analysed using descriptive and inferential statistics.

Results

The findings of the study showed that among 150 subjects majority of subjects (66%) had adequate level of knowledge, (28.66%) subjects had moderately adequate level of knowledge and (5.33%) subjects had inadequate level of knowledge regarding prevention and management of medication error. The mean score was 20.79 and standard deviation was ±2.322.The study findings revealed that there is significant association between prevention and management of medication error with selected socio-demographic variables such as professional qualification and any CNE attended on Medication error and there was no significant association between prevention and management of medication error with selected socio-demographic variables such as age,

gender, marital status, work experience and area of working.

Conclusion

The study revealed that most of the staff nurses have adequate knowledge regarding prevention and management of medication error. Lack of knowledge of nurses may lead to decreased patient quality. The gap in knowledge regarding prevention and management of medication error indicate the need to provide sufficient training to staff nurses.

Keywords: National Coordinating Council, World Health Organization, Continuing Nursing Education.

Introduction

Medication error is a globally prevalent problem which may lead to various diseases like therapeutic failure, adverse effect of drug, longer hospital stay as well as wastage of resources, even death. Errors that occur during the application of medical/surgical interventions or patient hospitalization have captured the health researcher's attention over last decade.[1]

In United States 7000 to 9000 people die due to medication error each year. Additionally, thousands of other patients experience, but do not report an adverse reaction or other complications related to medication. A major result to medication errors is that it lead to decreased satisfaction and a growing lack trust in the health care system.[2]

According to the United States National Coordinating Council (NCC) for Medication Error Reporting and Prevention , defines a Medication Error as, "Any preventable event that may cause or lead to inappropriate medication use or patient harm while the medication is in the control of the health care professional, patient, or consumer. Such events may be related to professional practice, health care products, procedures, and systems, including prescribing, order communication, product labelling, packaging and nomenclature, compounding, dispensing, distribution, administration, education, monitoring, and use."[3]

Types of Medication Error

- Prescribing error.
- Omission error.
- Wrong time error.
- Improper dose error.
- Administration errors include the incorrect route of administration, giving the drug to the wrong patient, extra dose, or wrong rate.
- Monitoring errors such failing to document allergy or potential for the drug interaction.
- Compliance errors such as not following protocol or rules established for dispensing and prescribing medications.[6]

Causes of Medication Error

- Expired Product-It usually occurs due to improper storage of preparations resulting in deterioration or use of expired products.
- Incorrect Duration- It occurs when medication is received for longer or shorter period of time than prescribed.
- Incorrect Preparation-This occurs with compounding or some other type of preparation before the administration.
- Incorrect Strength-This error usually occurs due to human error when similar bottles or syringes with the incorrect strength is selected.
- Incorrect Rate-It is most often with medications that are given as intravenously or infusions. This is particularly dangerous with many drugs and may result in significant adverse drug reactions.
- Incorrect Timing-This occurs when medications are not given in scheduled time.

- Incorrect Dose-This occurs when an inappropriate or different medication dose is given other than what was orders. It usually occur due to unclear labelling.
- Incorrect Dosage Form-This occurs when a patient receives a dosage form different than prescribed, such as immediate-release instead of extended-release.
- Known allergen- Dispensing a drug that a patient has an allergy which is often due to failure to communicate with the patient, inappropriate chart review, inaccurate charting, or lack of technological interface.
- Known Contraindication-This occurs when medications are not vigilantly reviewed for drug-drug, drug-disease, or drug-nutrient interactions. Distractions-One of the major causes of medication errors is distractions. Health care professionals have many duties in hospitals ,and in the midst of all this, they are distracted while treating the patient.[7]

Preventing Medication Errors

- **Know the patient**-This includes the patient name, age, weight, vital signs, allergies, diagnosis and current lab results.
- **Know the drug**-Nurses need to access the accurate, current, readily available drug information comes from computerized drug information systems, order sets.
- **Double Check High Alert Medicines**-High alert medications have devastating consequences if not administered properly. Medications which are look alike and sound alike can be a source of medication errors. Double check high alert medications with another nurse to prevent medication errors.
- **Documentation**-Accurate documentation is essential and should include name of the drug, dose, route, time, patient response after administering of drug.
- **Keep lines of communication open**-Breakdowns in communication among physicians, nurses, pharmacists and others in health care system can lead to medication errors. Communication is vitally important as it is the root cause of many sentinel events.
- **Inform the patient of the drugs they are receiving**-The patient must know the names of the medications what they are receiving or will be administered.[8]

Materials and Methods

Study Design

The study design used was non experimental descriptive research design.

Variables

Study variables: Knowledge regarding Prevention and management of medication error.

Socio demographic variables

Age, Gender, Educational Qualification, Marital Status, Working area, Years of Clinical Experience, Any CNE(Continuing Nursing Education) attended.

Setting of the Study

The study was conducted at Ramaiah Hospitals, Bangalore.

Sample size

150 staff nurses

Sampling technique

Non-probability convenient sampling technique.

Inclusion and Exclusion criteria

Inclusion criteria

Nurses who are available at the time of data collection.

Nurses working at Ramaiah Hospitals, Bangalore.

Exclusion criteria

Nurses who are not willing to participate.

Ethical clearance

Ethical clearance was obtained from ethical committee of Ramaiah Medical College Ethics committee on 29th

September 2022. (Reg.No.ECR/215/Inst/KA/2013/RR-22).

Data Collection Procedure

The data collection for main study was carried out from which was conducted on Ramaiah Hospitals, Bangalore. Formal permission was obtained from the medical superintendent of Ramaiah Hospitals, Bangalore .A total 150 subjects who met the selection criteria were selected using non probability convenient sampling technique during the data collection period.

Student researcher introduced herself, explained the purpose of the study to each subject and obtained an informed written consent from them for participating in the research study. Subjects were requested to respond to all two tools completely; Section-A(socio-demographic profile),Section-B (self-structured questionnaire),

Time taken to complete all three set of tool by each subjects was around 25-30 minutes. Doubts were clarified pertaining the tool. All the subjects returned the tool within the given time frame. Data collected from the subjects and confidentiality was maintained by not mentioning their name in the tool.

Development of tool

The development of tool required an extensive effort. Various literature were reviewed, including previous studies, journals etc. opinions were taken from the experts and research guide. The tool was validated and then put forth for data collection. The tool consists of 2 sections:

Section-A: Socio-demographic data

Socio-demographic data includes 7 items like age, gender, marital status, professional qualifications, total years of experience, area of working and any CNE attended.

Section-B: Structured questionnaire to assess the knowledge regarding prevention and management of medication error.

The self-structured knowledge questionnaire was developed by an extensive review of literature, discussion with the investigator's personal and professional experience. It consists of 25 items on various aspects on prevention and management of medication error.Each multiple choice question has 4 options out of which only 1 option is the correct answer and the other 3 are the wrong answers.

Scoring of items

Right response=1

Wrong response=0

Interpretation

- 20-25 or > 75%= Adequate knowledge.
- 15-19 or 50%-75%= Moderately adequate knowledge.
- Below 14 or <50%= Inadequate knowledge.

Data Collection Procedure

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Section-A (socio-demographic profile),Section-B (self-structured questionnaire),Time taken to complete all three set of tool by each subjects was around 25-30 minutes. Doubts were clarified pertaining the tool. All

the subjects returned the tool within the given time frame. Data collected from the subjects and confidentiality was maintained by not mentioning their name in the tool.

Statistical Method

Data obtained from the subjects were organized and analysed according to the objectives of the study using both descriptive and inferential statistics.

Descriptive Statistics

Frequency distribution, mean and percentage will be used to describe the socio demographic variables.

Inferential Statistics

Chi square test was used to find the association between the study variables and socio demographic variables.

Results

Among the staff nurses working in Ramaiah Hospitals, Bangalore, it was found that majority of staff nurses had adequate knowledge regarding prevention and management of staff nurses. The study findings revealed that 66% of the subjects had adequate knowledge, 28.66% of the subjects had moderate knowledge and 5.33% of the subjects had inadequate knowledge regarding prevention and management of medication error.

The mean score and standard deviation of the study was 20.79±2.322.

The study findings revealed that there was significant association between prevention and management of medication error with socio-demographic variables such professional qualification (p=0.029) and any CNE attended on Medication error (p=0.041) and there was no significant association between prevention and management of medication error and socio-demographic variables such as age ,gender, marital status, work experience and area of working.

Table 1: Frequency and percentage distributions of subjects with regards to socio-demographic variables (Age and Gender). n=150

Sn.	Socio-Demographic Variables	Frequency	Percentage%
1	Age in years		
	25-29years	35	23.3
	30-34years	64	42.7
	35-39years	41	27.3
	40-44years	5	3.3
	45-49years	5	3.3
2.	Gender		
	Male	60	40
	Female	90	60

Table 1: depicts that, majority of the subjects (42.7%) belonged to age group of 35-39 years. With regard to gender majority of subjects (60%) were female.

Table 2: Frequency and percentage distributions of subjects with regards to socio-demographic variables (Professional qualifications, Marital status. work experience in years) n=150

3.	Professional Qualification	Frequency	Percentage
	GNM Nursing	72	48
	B.Sc. Nursing	50	33.3
	P.B.B.Sc. Nursing	28	18.7
	M.Sc. Nursing	0	0
4	Marital Status		
	Single	41	27.3
	Married	109	72.7
	Widow	0	0
	Divorce	0	0
	Separated	0	0

5	Total Work experience in years		
	1-5	36	24.0
	6-10	88	58.7
	11-15	20	13.3
	16-20	6	4.0

Table 2: depicts that, majority of subjects (48%) were GNM nursing. With regards to marital status majority of subjects (72.7%) were married. With regards to total work experience in years majority of subjects (58.7%) were in 6-10 years.

Table 3: Frequency and percentage distributions of subjects with regards to socio-demographic variables (area of working and any CNE attended on Medication error), n=150

6	Area of working	Frequency	Percentage
	General Ward	86	57.3
	ICU	57	38.0
	Accident and Emergency	7	4.7
	Any other, specify	0	0
7	Any CNE attended on Medication error.		
	Yes	125	83.3
	No	25	16.7

Table 3: depicts that majority of subjects (57.7%) were working in general ward. With regard to any CNE attended on Medication error majority of subjects (83.3%) had attended CNE on Medication error.

Table 4: Frequency and percentage distribution of subjects in terms of prevention and management of medication error. n=150

Knowledge	Frequency(F)	Percentage%
Adequate knowledge	99	66
Moderately Adequate knowledge	43	28.66
Inadequate Knowledge	8	5.33

Table 4: depicts that of the subjects had adequate knowledge, of the subjects that moderately adequate knowledge and of the subjects had inadequate knowledge.

Table 5: Mean and Standard Deviation of prevention and management of medication error. n=150

	Minimum Score	Maximum Score	Mean	Standard Deviation
Knowledge	16	25	20.79	2.322

Table 5: depicts that the mean total sum scale of knowledge for prevention and management of medication error among participants was 20.79±2.322.

Table 6: Association between prevention and management of medication error with socio-demographic variables (age, gender)

Sn.	Socio-demographic variables	Knowledge			Chi square value χ^2	P value
		Adequate Knowledge	Moderately adequate knowledge	Inadequate Knowledge		
1.	Age in years					
a)	25-29 years	25	8	2	12.020 df=8	1.50 NS*
b)	30-34years	40	20	4		
c)	35-39years	24	15	2		
d)	40-44years	5				
e)	45-49 years	5				
2.	Gender					
a)	Male	40	15	5	0.352 df=1	0.838 NS*
b)	Female	59	28	3		

NS=Not significant, S=Significant, df =degree of freedom.

Table 6: depicts that there is no significant association between prevention and management of medication error with age and gender.

Table 7: Association between prevention and management of medication error with socio-demographic variables (professional qualification, marital status).

n=150

2.	Professional Qualification					
a)	G.N.M	50	20	2	10.804 df=4	0.029 S*
b)	B.SC Nursing	34	13	3		
c)	Post B.sc. Nursing	15	10	3		
3.	Marital Status					
a)	Single	25	13	3	3.236 df=2	0.198 NS*
b)	Married	64	40	5		

S=Significant, NS=Not significant, df=degree of freedom.

Table 7: Depicts that there is significant association between knowledge regarding prevention and management of medication error and professional qualification (p=0.029) and there is no significant association between prevention and management of medication error with marital status.

Table 8: Association between prevention and management of medication error with socio-demographic variables (work experience, area of working, any CNE attended on Medication error).

4.	Work experience					
a)	1-5years	23	10	3	4.390 df=6	0.624 NS*
b)	6-9years	62	23	3		
c)	11-15years	11	7	2		
d)	16-20years	5	1			
5.	Area of working.					
a)	General ward	60	20	6	3.593 df=4	0.464 NS*
b)	ICU	35	21	1		
c)	Accident and Emergency	4	2	1		
d)	Any other specify	0		0		
6.	Any CNE attended on Medication error.					
a)	Yes	89	31	5	9.971 df=4	0.041 S*
b)	No	10	12	3		

Table 8: Depicts that there is no significant association between prevention and management of medication with work experience and area of working and there is significant association between prevention and management of medication error and any CNE attended on Medication error (=0.041)

Discussion

The findings of the study showed that among 150 subjects majority of subjects (66%) had adequate level of knowledge, (28.66%) subjects had moderately adequate level of knowledge and (5.33%) subjects had inadequate level of knowledge regarding prevention and management of medication error. The mean score was 20.79 and standard deviation was ±2.322.

The study findings is consistent with a descriptive study conducted on SUM hospital, Odisha, India among 100 samples using convenient sampling technique on "Awareness of Medication Error, Medication Management and Prevention among Staff Nurses in IMS &Sum Hospital, Odisha" The study shows that most of the samples (67.6%) are having good knowledge about medication error and 33.3% having average knowledge and none of the samples has low score.

The study findings is contradicted with a descriptive study conducted in Punjab, India among 100 staff nurses using convenient sampling technique on" To assess the knowledge regarding Medication error among staff nurses at SGRD Hospital ,Punjab ."The study revealed

that 61% of nurses were having average knowledge, 32% had poor knowledge and 7% had good score.

The association between the study variable and socio-demographic variable was computed by using Chi-square test. It was found out there was a significant association between prevention and management of medication error and selected socio-demographic variables such as professional qualification (p=0.029) and any CNE attended on Medication error (p=0.041).

Thus, the hypothesis H_1 stated that there is significant association between prevention and management of medication error and selected socio-demographic variables is accepted for professional qualification (p=0.029) and any CNE attended on Medication error (p=0.041).

The findings are contradicted with the descriptive study conducted in SUM hospital Odisha, India among 100 samples using non probability convenient sampling technique on "Awareness of Medication Error, Medication Management and Prevention among Staff Nurses in IMS &Sum Hospital, Odisha". As per the findings there was no significant association in between knowledge score and demographic variables of staff nurses.

The study findings is consistent with a descriptive study conducted in Punjab among 100 staff nurses using convenient sampling technique on "To assess the knowledge of staff nurses at SGRD Hospital ,Punjab. "The study revealed that there were significant associations of knowledge with selected socio-demographic variables.

Limitations

The current study had following limitations:

- Authenticity of information regarding socio-demographic variables is only based on response of the samples.
- Since the study was conducted only in one hospital, findings may not be generalizable to other health care settings due to small sample size.

Conclusion

The following conclusion were drawn on the basis of findings of the study

Among the staff nurses working in Ramaiah Hospitals, Bangalore, it was found that majority of staff nurses had adequate knowledge regarding prevention and management of staff nurses. The study findings revealed that 66% of the subjects had adequate knowledge, 28.66% of the subjects had moderate knowledge and 5.33% of the subjects had inadequate knowledge regarding prevention and management of medication error.

The mean score and standard deviation of the study was 20.79±2.322.

The study findings revealed that there was significant association between prevention and management of medication error with socio-demographic variables such professional qualification (p=0.029) and any CNE attended on Medication error (p=0.041) and there was no significant association between prevention and management of medication error and socio-demographic variables such as age ,gender, marital status, work experience and area of working.

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