

# A STUDY TO EVALUATE THE SKILL COMPETENCY PROGRAM ON PARENTERAL DRUG ADMINISTRATION IN TERMS OF KNOWLEDGE AND PRACTICE AMONG STAFF NURSES WORKING IN PEDIATRIC UNITS IN SELECTED HOSPITAL AT MEERUT

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**Abstract-** This study has been undertaken to Evaluate A study to evaluate the skill competency program on parenteral drug administration in terms of knowledge and practice among staff nurses working in pediatric units in selected hospital at Meerut. An experimental research design was chosen for the present study to assess the knowledge and practice regarding parenteral drugs administration among nurses working in pediatric units of selected hospitals at and Dependent variable is knowledge and practice of staff nurses regarding parenteral drugs among nurses working in pediatric units. The sample of this study comprised of 30 staff nurses working in pediatric unit of a selected CSSH hospital Meerut those who fulfilled the inclusion and exclusion criteria. Non-probability purposive sampling technique was used to draw the sample for the study. A pilot study was conducted for 4 staff nurses' samples at Lokpriye hospital Meerut. This helped to establish the reliability of the tool and to test the feasibility and practicability of the whole research design.

## 1.INTRODUCTION

A medication is a substance used in the diagnosis, treatment, cure, relief or prevention of health alterations. In fact, medications are the primary treatment client associate with restoration of health. Too much of a medicine may cause severe unwanted effects. Separate medicines can have unnecessary interactions when used together. An expired medicine or one that is stored wrongly can be ineffective or even dangerous. An inappropriate route can cause unnecessary pain and ineffectiveness of a medication. Taking the wrong medicine can be as dangerous as being poisoned. The list goes on and these errors can add up to weigh down on the health, becoming very costly in the process. The most commonly observed error in the hospital setting is related with medication administration. Medication administration error is defined as any preventable event which occurs in the time period which starts with supply of a medication and includes the follow-up period after administration. The risk is higher in drug administrations in the childhood age group compared to adults. Many factors including reconstitution, preservation and interaction with other fluids in addition to inappropriate commercial format of the drugs which will be used in the childhood age group predispose to errors. It is the physician's responsibility to prescribe drugs in the correct dosage to achieve the desired effect without endangering the health of the child. However, nurses must have an understanding of the safe dosage of medication, administration to children, as well as the expected action, possible side-effects and signs of toxicity. Unlike with the adult medication, there are few standardized, pediatric drug dosage ranges and with a few exceptions drugs are prepared and packaged in average adult dose strength. Nurses constitute the most important element in noticing and preventing the errors in order to decrease the risks in the process of administration of drugs to children. In our country, nurses are responsible for preparation and administration of drugs after the order is given in all therapeutically institutions. Since nurses are responsible of having information about drugs, drug preparation, checking drugs, administration of drugs and assessment of therapy, they should be continuously educated throughout their career. Administration of medicine is one of the greatest responsibilities of a nurse. She should see that all medicines are administered so as to obtain best results. Giving medications to children is a serious responsibility. The need for accuracy in preparing and giving medications to children is even greater than with adult patients. Since the pediatric dose is often relatively small in comparison with the adult dose, a slight mistake in the amount of drug administered represents a greater proportional error. Pediatric nurses are often the gatekeeper of medication administration. Medication administration is a critical skill of the professional nurse, who must understand and follow various steps in the drug administration process to assure patient safety. The nurse must be proficient in medication dosage calculation to safely administer drugs. A study was conducted on role of incident reports by Physicians and Nurses to Document Errors in Pediatric Patients in Washington. Out of a total of 140 surveys which consists of 64 nurses and 74 physicians, nurses were significantly more to report more than 80% of their own medical errors than physicians. Almost all pediatric medications require mathematical calculation, one that may be complex. Lack of drug knowledge may cause medication errors. Errors in calculating drug doses in infants and small children can cause morbidity and mortality. Performing drug calculation accurately is an essential skill for practicing nurse. If the nurse does not perform the mathematical computation in clinical settings, the patient is affected. In Pediatric settings, accurate doses are especially important. Even small discrepancies can be dangerous because of the small size of the patients. As Meyer stated "There is no permissible error".

## 2.BACKGROUND OF THE STUDY:

A study was conducted by Pankaj Agrawal et.al (2012) in Delhi India the aims of the study was finding out the occurrence of medication errors and the occurrence of risk factors for medication errors in the inpatient setting of the general hospitals in Delhi. 20 doctors, 30 nurses, 45 pharmacists, 500 patients charts were the population involved in the study. It was recorded that 88 out of the 1063 prescriptions resulted in ADEs, representing 8.2%. This implies that out of every 1000 prescriptions, approximately 82 are likely to result in ADEs in the inpatients of OPD setting of general hospitals and Clinics in Delhi. These results put the records of occurrence of medication errors in this study very high.

A prospective, observational study was conducted in General Medicine and Pediatric ward of Civil Hospital, Ahmedabad during October 2012. A total of 1109 patients (511 in Medicine and 598 in Pediatric ward) were included during the study period. Total number of Medication Errors was 403 (36%) of which, 195 (38%) were in Medicine and 208 (35%) were in Pediatric wards. The most common Medication Error was Pediatric errors 262 (65%) followed by Adult Errors 126 (31%).

The background information supports that medication safety is an important part of patient safety. Errors in IV medication administration to the pediatric client can be reduced with the use of infusion technology and education to the nursing staff. Intravenous medication administration or IV therapy is the giving of medications directly into vein. The word intravenous simply means "within a vein". Therapies administered intravenously are often called specially pharmaceuticals. It is commonly referred to as a drip because many systems of administration employ a drip chamber, which prevents air entering the blood stream (air embolism) and allows an estimate of flow rate, intravenous therapy may be used to correct electrolyte imbalance, to deliver medications, for blood transfusion or as fluid replacement to correct, for example, dehydration. Compared with other routes of administration, the intravenous route is the fastest way to deliver fluids and medications throughout the body.

A study was conducted in 2000, on Medical Errors in Pediatric Practice among 1286 children, which showed an incidence of medical errors in a tertiary care pediatric unit in India as 35.5% and severe morbidity due to errors was seen in 2.4%. The total number of detected errors was 457/1286 (35.5%), the errors attributed by the nursing staff was found to be 181 (39.6%).

A study conducted on 960 randomly selected children from 12 children's hospital in California on adverse drug events in an inpatient pediatric population revealed 11.1% rate of adverse drug events. The study also showed that 22% of those adverse drug events were preventable, 17.8% could have been identified earlier, and 16.8% could have been mitigated more effectively.

The safe administration of medication to children presents a number of problems that are not encountered when giving medication to adult patients. Children vary widely in age, weight, body surface area and the ability to absorb, metabolize and excrete medications. Nurses must be particularly alert when computing and administering drugs to infant and children. The type and frequency of errors in the administration of a drug is a reflection of the quality of the nursing system. As the knowledge of medication improves and the variety of available medication increases, nurses must continue to develop their knowledge and understanding to ensure medication safety. By reviewing the above facts and with personal interest based on clinical experiences, the investigator felt the study will help to improve nurses' knowledge on pediatric drug administration for which the study is undertaken.

## 3.NEED OF THE STUDY-

### "Knowledge is of no value unless you put it into practice" -(Anton Chekhov)

Perry & Potter stated that medication administration is one of the fundamental tasks performed by nurses in everyday clinical practice. Nurses need pharmacological skills to contribute effectively to medication administration, to advise patients on issues related to their treatments, to administer appropriate medicines correctly and to identify and make a preliminary evaluation of adverse drug effects.

The growth of science and technologies has given rise to rapid advancement in the field of medical science and patient care. In the recent years there has been a tremendous development in the field of pharmacology too, resulting in a multiplicity of drug products. The safe and accurate medication administration is a daily basic activity in nursing practice and nurses need to have sufficient knowledge, attitude and competency to perform these tasks.

Sandra Fleming (2014) was stated that the primary reason for errors in this category can be attributed to conceptual errors where the participants failed to extract the information accurately or to use a systematic approach to establishing the calculation rather than error in calculation skill.

From the above studies it showed that high percentage learning needs about the administration and calculation of medication was felt among staff nurses. The investigators personally has experience while working as a staff nurse in NICU and found that there are more incidence of error during parental drug administration and they do not have expert knowledge in the use of drugs. Therefore the investigator decided to take up the study to evaluate the effectiveness of skill competency programme on parenteral drugs administration in terms of knowledge and practice among staff nurses working in pediatric units it will help to prevent medication error

### 3.1 Population and Sample

The targeted population for the study The population included in the study were the registered staff nurses working in selected hospital at Meerut selected as a sample. The sample were 30 staff nurses working in pediatric unit of a selected hospital.

### 3.2 Data and Sources of Data

Formal administrative permission was taken permission from medical superintendent, CSSH Meerut. The data collection period is ranging from 18-07-2018 to 25-7-2018. 30 staff nurses were selected from selected Hospital by Non probability Purposive sampling technique

### 3.3 Theoretical framework

Variables of the study contains dependent and independent variable. The study used knowledge and practice of staff nurses regarding parenteral drugs among nurses working in pediatric units is as dependent variable. Independent variable skill training program on knowledge and practice regarding parenteral drugs among nurses working in pediatric units

### 3.4 Statistical tools

This section elaborate the proper Statistical / skill training program which are used to forward the study from data toward interference. The detail of methodology is given as follows

#### 3.4.1 Descriptive Statistics

Descriptive Statics has been used to The collected data was organized, tabulated. Analyzed and interpreted using descriptive and inferential statistics. The findings were organized and presented in two parts with Tables and graphs (paired t test and chi square which helped to find out the effectiveness of skill training program on knowledge and practice regarding parenteral drugs among nurses working in pediatric units

## IV. RESULTS AND DISCUSSION

### 4.1 Descriptive Statics of Study

#### Section I

This section deal with the distribution of primigravida mothers according to demographic variables by frequency and percentage

Table :4.1

N = 30

S.N	DEMOGRAPHIC VARIABLES	FREQUENCY	FREQUENCY PERCENTAGE
1.	AGE GROUP		
	21-25	16	53.3
	26-30	12	40
	31-35	2	6.6
	36-40	0	0.0

➤ Table 4. table 1 shows that Distribution of staff nurses according to their age depicts that highest percentage (53.33%) i.e.16 of the staff nurses were in the age groups of (21-25) & (40.00%) i.e. 12 staff nurses were in the age groups of (26-30) & least (6.67%) i.e. 2 staff nurses were in the age of (31-35).

#### Section II

This section deals with the Assessment related to knowledge score of parental (IV drug) administration before and after skill competency program.

Table 5.1

N= 30

LEVEL OF KNOWLEDGE	PRE TEST		POST TEST	
	Frequency	%	Frequency	%
POOR(0-7)	27	90%	0	0%
AVERAGE(8-11)	3	10%	9	30%
GOOD (12-15)	0		21	70%

**Table -5.1** - Data represented in table 2 depicted that 27(90%) i.e.; majority of nursing staffs had poor level of knowledge in pre – test. only, 3(10%) of nursing staff had average knowledge but in post – test 21 (70%) of nursing staff had good level of knowledge scores, 9 (30%) of nursing staff had average level of knowledge scores regarding IV drug administration.

**Table 5.2**

**Assessment related to knowledge score of parental (IM drug) administration before and after skill competency program.**

LEVEL OF KNOWLEDGE	PRE TEST		POST TEST	
	Frequency	%	Frequency	%
POOR(0-7)	22	73.33%	1	3%
AVERAGE(8-11)	8	26.66%	11	36.66%
GOOD (12-15)	0	0%	18	60%

Table 5.2 -Data represented in table 3 depicted that 22(73.33%) i.e.; majority of nursing staffs had poor level of knowledge in pre – test. only, 8(26.66%) of nursing staff had average knowledge but in post – test 18 (60%) of nursing staff had good level of knowledge scores, 11 (36.66 %) of nursing staff had Average level of knowledge scores regarding IM drug administration.

**Section – III**

**Assessment related to knowledge score of parental (IV and IM drug) administration before and after skill competency program.**

This section carries two parts as follows:-

Part I: Assessment related to knowledge score of parental (IV drug) administration before and after skill competency program.

Part II: Assessment related to knowledge score of parental (IM drug) administration before and after skill competency program.

**Part I: Assessment related to knowledge score of parental (IV drug) administration before and after skill competency program.**

Table – 2

N= 30

LEVEL OF KNOWLEDGE	PRE TEST		POST TEST	
	Frequency	%	Frequency	%
POOR(0-7)	27	90%	0	0%
AVERAGE(8-11)	3	10%	9	30%
GOOD (12-15)	0		21	70%

**DATA PRESENTED IN TABLE2 DEPICTS:**

Data represented in table 2 depicted that 27(90%) i.e.; majority of nursing staffs had poor level of knowledge in pre – test. only, 3(10%) of nursing staff had average knowledge but in post – test 21 (70%) of nursing staff had good level of knowledge scores, 9 (30%) of nursing staff had average level of knowledge scores regarding IV drug administration.

**Part II: Assessment related to knowledge score of parental (IM drug) administration before and after skill competency program.**

LEVEL OF KNOWLEDGE	PRE TEST		POST TEST	
	Frequency	%	Frequency	%
POOR(0-7)	22	73.33%	1	3%
AVERAGE(8-11)	8	26.66%	11	36.66%
GOOD (12-15)	0	0%	18	60%

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**Section V**

**Association between posttest (IV) Practice score (Observation checklist) score with selected demographic variables.**

**Table – 13**

N= 30

Selected variables	Knowledge level of staff nurses		Chi- square		Degree of freedom	Significance
	> Mean	< Mean	Calculated value	Table Value		
Age group						
1.21-25	6	10	1.034	7.815	3	N.S
2.26-30	5	7				
3.31-35	0	2				
4.36-40	0	0				

Selected variables	Knowledge level of staff nurses		Chi- square		Degree of freedom	Significance
	> Mean	< Mean	Calculated value	Table Value		
<b>Gender</b>						
1.Male	0	2	.074	3.841	1	N.S
2.Female	11	17				
<b>Professional Qualification</b>						
1.GNM	8	16	.259	5.991	2	N.S
2.PB BSc	3	1				
3.BSc. Nursing	0	2				
4.MSc nursing	0	0				
5Any other specialty course	0	0				
<b>Year of working experience in pediatric unit</b>						
1. 0 to 2 year	8	14	6.724	5.991	2	S
2. 3 to 5 year	2	2				
3. 6 to 8 year	2	2				
4.9to 11 year	0	0				
<b>Type of area (pediatric unit) where the staff is working</b>						
1.Ward	9	6	1.034	5.991	2	N.S.
2.NICU	0	7				
3.PICU	3	4				
4.OPD	0	1				
<b>Any previous course/workshop attended regarding drug administration/pharmacologic</b>						
1.Yes	5	5	.517	3.841	1	N.S
2.No	6	14				

The above table 13 shown that there is only one significant association between posttest IV practice score with years of working experience of staff nurses whereas there is no significant association between posttest IV practice score & demographic variable like age, gender, professional qualification, type of area (pediatric unit) the staff nurse is working, any previous workshop/course regarding drug administration attended. Hence the research **hypothesis H3** was accepted only with one demographic variable i.e. years of working experience.

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