

# Medication Error Rate and Barriers in its Reporting



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## Abstract

Medication errors occur in all health care settings. Large numbers of hospitalised paediatric patients are harmed or injured or experience adverse drug events as a result of medication errors, each year. Therefore, an exploratory study was conducted to identify the medication error rate and barriers in reporting, with a view to develop medication error reporting form for nurses working in paediatric units at selected hospitals of Indore. The main objective of the study was to assess the medication error rate and factors contributing to medication error and barriers in its reporting. An exploratory study design was adopted and 100 nurses were selected from the population working in pediatric units. Non participant observational method was used to identify the medication errors. Medication administration assessment form was used to identify the medication error rate, and assessment scale was used to identify the factors causing medication error and barriers to medication error reporting. Results revealed that 170 errors were found out in 300 observations and total medication error rate was found to be 56.66%. The most common type of error prevailing was found to be the wrong time i.e. 95(31.66%). Predominant factors leading to medication error were frequent change in paediatrician's order 60%, low nurse patient ratio 58% and 54% due to illegible paediatrician's order. Regarding barrier in reporting medication error 85% responded contacting paediatrician was time consuming, 55% reported face saving and 49.3% reported administrative response as a barrier.

**Key words:** Medication errors, Types of medication errors, Barriers in reporting medication errors.

## Background

Patient's age is the most important risk factor for Medication Administration Errors (MAEs). As recent evidence from United States indicated, potentially harmful MAEs may be three times more common in the paediatric population than among adults; this suggests that the epidemiologic characteristics of the errors may be different between adults and children.

The causes of medication errors are more complicated since they involve a wide variety of organizational and human factors. In general, organizational factors linked to risks of medication errors include: working conditions such as working hours, physical environment, staffing, working processes, and organizational culture. Human factors also contribute to medication errors such as:

communication, peer relationships, knowledge, and work experience. These factors not only influence risks of medication error occurrence, but also medication error reporting.<sup>1</sup>

## Need of the Study & Literature Review

Medication administration is an activity that is prone to errors because of the proliferation of new devices and new drug products. Medication is administered through a variety of routes, dosage forms and dosing regimens. Moreover, medication orders are changed frequently as pharmacists and medical specialists provide input into patient care based on changes in patient clinical status and the results of diagnostic tests. The administration of medication by nurses is the final step in a process that involves multiple steps carried out by a number of health

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professionals (medical practitioners, pharmacists and registered nurses). The accuracy, efficiency and safety of administration of medications rest primarily with nurses. (Nancy LG, 2013)<sup>2</sup>

An observational study was conducted by S. Aneja, S.K. Mahandirata in 2010 to assess error in medication in paediatric ward at Kalawati Saranj Children's hospital, New Delhi on 700 patients. It was found that error rate was 30% prescription error, 22% dispensing errors and 15% errors in missed dosage.<sup>3</sup>

Apollo Hospitals Educational and research foundation conducted a survey study on error in administration of intravenous medications, 107 nurses and 568 observations using purposive sampling technique. Results revealed that out of 568 administrations, 69.7% were total errors and 25.5% of these were serious. Four error types: wrong intravenous rate, mixture, volume and drug incompatibility accounted for 91.7%. Error rates and severity decreases with clinical experience. Study concluded that significant proportion of error suggested skill and knowledge deficiencies, with error and severity reducing as clinical experience increases.<sup>4</sup>

Researcher during her clinical experience in paediatric ward observed that medication errors were frequent and most of them were preventable. For instance, nurses would administer medication 1 hour before or after the schedule time. In that case, the effectiveness of medication remains in query. Hence researcher took up this study.

### **Problem Statement**

An exploratory study to identify the medication error rate and barriers in reporting, in a view to develop medication error reporting form among nurses working in paediatric unit at selected hospitals.

### **Objectives**

- To find out medication error rate among nurses working in pediatric units.
- To determine the types of medication error among

nurses.

- To identify the factors leading to medication administration error.
- To find out the barriers to medication administration error reporting.
- To determine the association between medication error rate and selected socio demographic variables.

### **Hypothesis**

**H<sub>1</sub>**, There is significant association between medication error rate and selected Socio demographic variables at the level  $p=0.05$ .

### **Assumption**

There is high incidence of medication error rate in paediatric units.

### **Research Methodology**

**Research design:** Exploratory design was used for the study.

**Population:** Registered nurses working in paediatric units at selected hospitals of Indore.

**Sampling Technique:** Non-probability purposive sampling technique was used.

**Sample Size:** The sample size of 100 Registered nurses working in paediatric units.

**Setting:** Paediatric units of five selected hospitals of Indore.

**Tool:** The tool for collection of data consisted of three four sections:-

**Section A:** Socio demographic variables of staff nurses- 5 items

**Section B:** Medication administration assessment form 7 items

**Section C:** Assessment scale to identify the factors causing medication error 17 items

**Section D:** Assessment scale to assess Barriers to

Medication Error Reporting among staff nurses- total 20 items

**Validity and Reliability:** Validity of tool was done by 7 experts. Reliability of the assessment scale to assess the factors in medication error was calculated using rater-intra-rater method which was computed by Karl Pearson correlation formula and it was found to be  $r=0.83$  and the reliability of barriers in medication error reporting was calculated using rater- intra-rater method and it was found to be  $r=0.86$ .

**Pilot Study:** Pilot study was conducted on 10 staff nurses who fulfilled the sampling criteria in order to find out the feasibility and applicability of tool of the study. Total 30 observations were done. The analysis of the pilot study revealed that objectives of the study could be fulfilled based on information investigator proceeded with actual data collection.

**Procedure for Data Collection:** Written permission was obtained from the concerned authorities of selected hospitals of Indore. A total of 100 samples were selected as participants through purposive sampling technique who met the inclusion criteria. Prior to the data collection consent was taken from the participants. Non-participant observational study was used to assess the medication administration error. 3 observations were done on one participant so total 300 observations were done to find out medication error rate. The purpose of the study was explained to the participants and self assessment rating scale was used to analyze the factors causing medication error and barriers in medication error reporting.

## Findings

### Section I. Socio demographic variables of nurses

Results revealed that out of 100 nurses, 48(48%) were from the age group of 21-25 years, 52(52%) were GNMs, 43(43%) had clinical experience for 1-5 years, 50(50%) had 1-5 years of experience in paediatric unit, and 61(61%) had no exposure to in- service education .

### Section II. Medication Error Rate among nurses working in Paediatric Unit.

**Table No. 1 Medication Error Rate among nurses working in Paediatric Unit.**

**N=100**

**Number of Observations =300**

Total No. of Staff nurses	Total No. of observations	Frequency(f) Medication Error	Medication Error Rate
100	300	170	56.66%

The data presented in the Table No. 1 shows that medication error among staff nurses working in paediatric unit. One nurse = 3 observations were done, thus 300 observations were done on 100 nurses. From the observation 170 medication errors were identified out of 300 observations. Thus it was found that medication error rate was 56.66%.

**Table No.2: Frequency and percentage distribution of Types of Medication Error among staff nurses**

**N=100**

**Number of Observations =300**

Types of Error	Frequency	Percentage
Wrong Time	95	31.66
Wrong Dose	41	13.66
Omission Error	28	9.33
Wrong Drug	6	2
Wrong Route	0	0

Table No. 2 depicted that out of 300 observations, total of 170 errors were identified, ie 56.66% of total medication errors. From these, most common type of medication error among staff nurses was wrong time error 95(31.66%), followed by wrong dose 41(13.66%), nearly one-fourth 28(9.33%) of the error were omission error and 6(2%) were wrong drug and no wrong route error were identified

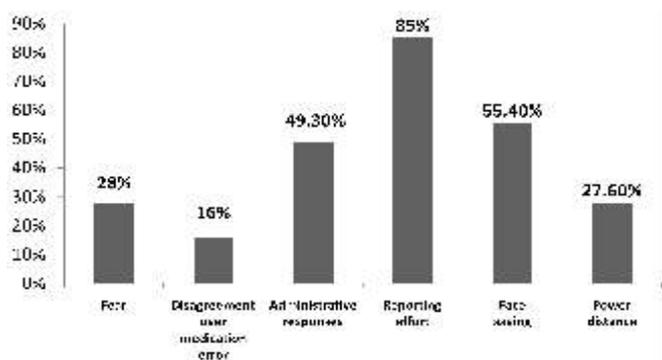
### Section IV. Identification of factors leading to medication error

**Table No 3 : Frequency and percentage of factors leading to medication error N=100**

S.no.	Top 10 Factors	f	%
1.	Frequent change in physicians order	61	61%
2.	Low nurse patient ratio	58	58%
3.	Lack of clinical experience	55	55%
4.	Illegible physicians order	54	54%
5.	In availability of medication protocol	52	52%
6.	Lack of opportunity to attend In-service education	51	51%
7.	Lack of time to administer drug	48	48%
8.	Insufficient time to recheck patients file before drug administration	48	48%
9.	Lack of communication between doctors and Nurses		
10.	Physician's verbal order	31	31%

Data represented in the table 4(c) reveals the top ten prevailing factors leading to medication error among staff nurses. Frequent change in physicians order (61%) is the most common factor which causes medication error followed by low-nurse patient ratio (58%), lack of clinical experience (55%) also contributed to the medication error. Illegible physicians order (54%) and in availability of medication protocol (52%) are also the leading factors in medication error.

**SECTION V. Assessment of response of staff nurses in barriers in medication error reporting**



**Fig no 3: Bar diagram showing the highest percentage of barriers in Medication Administration Error Reporting by staff nurses.**

The above data represents the highest percentage of barrier in reporting medication error among staff nurses. It was found that majority (85%) of the staff nurses responded reporting effort as the major cause of barrier in reporting medication error, more than half (55.4%) responded face saving, half of them (49.3%) responded administrative responses, more than one fourth (28%) responded fear as the barrier in reporting medication error, power distance (27.6%) and only (16%) responded disagreement over medication error as the barrier in reporting medication error.

**Section VII. Association of medication error with socio demographic variables**

It was observed that there is no significant association between the medication error with socio demographic variables like age, professional qualification, total years of professional experience, total years of experience in paediatric unit and exposure to any In-service education at the level  $p = 0.05$ . Hence, Hypothesis  $H_1$  is accepted.

**Discussion**

**Medication error rate among nurses working in pediatric units**

It was found that among 300 observations on 100 nurses, 170 errors were found. Total medication error rate was found to be 56.66%.

The above findings can be supported by the study conducted by **Karna Khavane, Sanjay Sharma(2012)<sup>5</sup>** to identify the incidence rate of medication error in pediatric unit, Gulbarga, Karnataka. Among the 500 patients followed, 167 medication errors were found out of which 26 patients had more than one error during their hospital stay. Overall incidence of medication errors was found to be 33.4%. The study concluded that there was high incidence of medication error among pediatric nurses.

**Types of Medication Error**

The results of data analysis depicts that out of 300 observations conducted among 100 paediatric staff nurses, a total of 170 errors were identified, out of which four types of error were found out -wrong time, wrong

dose, omission error and wrong drug accounted for 56.66% of errors and no wrong route were identified. From these, most common type of medication error among staff nurses is wrong time error 95(31.66%).

The above findings can be supported by the study conducted by **Biniyam Girma (2012)**<sup>6</sup> a prospective case-based observational study was performed in the three units of the paediatric ward of Benin, Nigeria. The study was conducted among 425 paediatric patients. A total of 196 (89.9 %) MAEs were identified from the 218 observations made. The most frequent of the MAEs observed was wrong time error with 55 errors or 28.1 % of the total, while 52 (26.5 %) were dose errors and 42 (21.4 %) were due to drugs omitted during drug administration. Furthermore, wrong administration technique errors and unauthorized drug errors were 41 (20.9 %) and 6 (3.1%), respectively.

#### **Factors leading to medication error**

Above findings can be supported with the study conducted by **Stratton (2004)**<sup>7</sup> conducted a survey study in 250 pediatric nurses at children's hospital at Lahore, Pakistan. The results of the study revealed that long working hours, high patient/nurse ratio, insufficient knowledge of the medication, as the primary causes of medication errors by pediatric nurses.

Above findings can be supported with the study conducted by **Qazvin Medical University teaching hospitals (2009)**<sup>8</sup> on a sample of 150 nurses working in paediatric unit. The results showed that the ward related factors are the most effective factors ( $55.44 \pm 9.14$ ) while the factors related to the management system ( $52.84 \pm 11.24$ ) and the nurse related ( $44.0 \pm 10.89$ ) are respectively less effective. The physiological factors which accounted for errors were lack of adequate staff in each shift, illegible physicians order and physician's verbal order.

#### **Barriers in medication error reporting**

The result of the data analysis depicted that majority (85%) of the staff nurses responded reporting effort as the major cause of barrier in reporting medication error, more

than half (55.4%) responded face saving, half of them (49.3%) responded administrative responses, more than one fourth (28%) responded fear as the barrier in reporting medication error, power distance (27.6%) and only power distance (16%) said disagreement over medication error as the barrier in reporting medication error.

Above findings are supported by the study conducted **Ahmad E. Aboshaiqah (2013)**<sup>9</sup> to assess why medication administration errors are not reported as perceived by nurses in a large government-owned tertiary hospital in Saudi Arabia. A cross-sectional survey was conducted among 307 nurses among paediatric units and the results indicated that nurses in this setting perceived administrative response, blaming and focusing on the individual rather than looking at the systems as potential cause of error ( $M=4.12$ ) were the top two perceived reasons why medication administration errors were not reported.

### **Conclusion**

A lot more needs to be done to quantify the problem of medication errors and take necessary steps to improve the quality of health care delivery. Reporting both errors and near misses has been key to improve safety of the patient. Good medication error reporting system should be developed to reduce the incidence of medication errors and improve the health care along with regular in-service education on medication administration including new emerging medications. Working towards with these goals, the quality of life of our children will get better through efficient health care delivery.

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