

## EVALUATE THE INCIDENCE OF MEDICATION ERROR AND TO CATEGORIZE MEDICATION ERROR IN VARIOUS DEPARTMENTS IN A MULTISPECIALITY HOSPITAL – A PROSPECTIVE OBSERVATIONAL STUDY

Kannan Subramaniam\*, Ashith R.<sup>1</sup>, Bharath R.<sup>2</sup>, Chandra Prakash R.<sup>3</sup>, Anandhasayanam A.<sup>4</sup>, Sangameswaran B.<sup>5</sup>

\*Professor & HOD Department of Pharmacy Practice, SSM College of Pharmacy,

<sup>1,2,3</sup>B.Pharm Final Year Research Scholar, SSM College of Pharmacy,

<sup>4</sup>Professor, Department of Pharmacy Practice, SSM College of Pharmacy,

<sup>5</sup>Principal, SSM College of Pharmacy,

Affiliated to The Tamil Nadu Dr. M.G.R. Medical University,

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### \*Corresponding Author: Kannan Subramaniam

Professor & HOD Department of Pharmacy Practice, SSM College of Pharmacy, Affiliated to The Tamil Nadu Dr. M.G.R. Medical University.

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### ABSTRACT

**Aim & Objectives:** of the research was to determine the incidence, rate, and types of medication errors within the tertiary level care hospital setting. **Methods:** A prospective Observational study was conducted in Multispecialty Hospital from Over a three-month period, and pattern and rate of medication errors were determined from a review of clinical records of 450 patients. The primary focus areas in the study comprised of Cardiology, Pulmonology, Neurology, Pediatrics, Gastroenterology and Nephrology departments. **Results:** The average most common mistake made were Prescribing errors (50%). Prescription errors were also followed by Administrating errors (35%), and Dispensing errors (11%). Contributing factors included an unfriendly environment, low levels of communication, and poor attention around the workplace. The study has also determined that lack of attention on the prescription writing order by the Physicians (42%) and Nurses (44%) exerts serious negative medication outcomes. The highest medication errors were tallied in the Cardiology (22.2%) and Pulmonology (18.6%) departments. **Conclusion:** Most errors did not caused harm, but a significant number of them were possible adverse events. It has been critically illustrated by this particular research that there is a crucial need to develop communication, administrative, and educational workloads.

**KEYWORDS:** Medication Errors, Prescribing Errors, Administration Errors, Dispensing Errors.

Any preventable event that causes or leads to inappropriate medication use or patient harm while the medication is under the control of a health professional, patient or consumer. Most Studies refer to Three main types of Medication Errors. They are as Follows,

- Prescribing Error
- Dispensing Error
- Administering Error

Medication errors are common in outpatient and ambulatory settings, with prescribing errors and dosing errors being the most prevalent.<sup>[1]</sup> Latent conditions, including inadequate training or knowledge, were more common followed by active failures. Mistakes and violations were the most frequent contributory factors related to active failures.<sup>[2]</sup>

According to the World Health Organization's publication titled "*Medication Errors: Technical Series on Safer Primary Care*," the following factors have been associated with an increased risk of medication errors in the primary care setting:

- Lack of therapeutic training or inadequate knowledge.
- Poor communication with patients.
- A language barrier between healthcare professionals and patients.
- Increased workload.<sup>[3]</sup>

Reducing medication errors is critical. In addition to recognizing common medication error risk factors, healthcare providers must implement workplace strategies to prevent adverse drug events.<sup>[4]</sup> Systems that use information technology (IT), such as computerized physician order entry, automated dispensing, barcode medication administration, electronic medication reconciliation, and personal health records, are vital components of strategies to prevent medication errors, and a growing body of evidence calls for their widespread implementation.<sup>[5]</sup>

Objectives of the project will seek to identify medication errors by collecting and analyzing patient records, classifying errors by type and comparing their occurrence across departments. This study will also attempt to understand the underlying causes of these errors and the extent to which they affect patient outcomes. The information gathered from addressing these issues will mitigate the degree of error committed and promote patient safety within the system, while offering valuable evidence for improving targeted intervention in the health system.

## MATERIALS AND METHODS

**Study Type:** A prospective Observational Study.

**Study Period:** Study was conducted in a Three Month from December 2024 to February 2025

**Study Site:** Sudha Institute of Medical Science, Erode (SIMS) which is a 300 Bedded Multi- Specialty Hospital at Erode.

**Study Population:** 450 Patient's Data were collected from Different Departments.

### Study Criteria

#### Inclusion Criteria

- All inpatients, Including Pulmonology, Cardiology, Neurology, Gastroenterology, Pediatrics and Nephrology.
- Medication Error pertaining to prescription Error, Transcription Error, Dispensing Error & Administration Error as per the standard Definition happened in the Hospital premises.

### Exclusion Criteria

- In-patients without medication therapy.
- Medication error related Homeopathy, Ayurvedic preparation data excluded from the study.

### STUDY PROCEDURE

Case sheets of inpatients in various departments were collected which include patient demographic details and criteria for identifying errors and its categorization. Complete details of patients and medications were recorded through reviewing medication charts, by reviewing prescriptions in pharmacy. Identify and analyze medication errors. Data on medication administration, prescriptions, and dispensing were reported in the hospital's Medication Error Forms.

### STATISTICAL ANALYSIS

The data obtained was entered into MS Excel can be used to describe the data. Categorical variables - Frequencies and percentages were used for the research.

### OBSERVATIONS

A observational study Conducted with Medication Error Forms.450 patients from Pulmonology, Cardiology, Neurology and Nephrology departments of a tertiary care hospital.

**Table 1: Age and Gender Wise Distribution Of Medication Error.**

Category (Age in Yrs & Gender)	No. of Patients (n=450)	Percentage of Patients (%)
1-15 years	89	20
16-25 years	36	8
26-40 years	54	20
41-60 years	169	37
Above 60 years	102	23
Male	284	63
Female	166	37

Most of the patients with medication errors belonged to the age group of 41-60, occupying **37%** of the overall cases, while 1-15 age groups comprised **20%** of cases and over 60 years for **23%** cases. The age group between 16-25 years consisted of only **8%** affected patients, whereas 26-40 age group had **20%** of all medication error cases of patients.

Out of those 450 Patients, men made up the majority at **63%** while women comprised **37%** of the patients that experiencing medication errors. In total, there were **284 men** and **166 women** that encountered these issues.

**Table 2: Severity Level of Medication Error.**

Error Category	No Error	Error Harm	Error No Harm	Error Death
Cardiology	34	3	64	0
Pulmonology	35	6	45	0
Neurology	21	2	55	0
Gastroenterology	11	1	12	0
Pediatrics	29	2	51	0
Nephrology	10	3	31	0
Others	9	3	23	0

In the Cardiology, Pulmonology, and Neurology medical departments, the frequency of errors differs by category. Highest number of "No error" cases was seen in Pulmonology with (35), followed by Cardiology with (34), and

Neurology with (21) cases. In the context of “Error Harm”, Cardiology recorded (3), Pulmonology recorded (6), and Neurology had (2) cases.

The largest number of “Error no harm” occurred in Cardiology (64), then Neurology (55), and Pulmonology had (45) cases. Interestingly, there were “no Error Death” in any of the departments. In the Medical Departments of Gastroenterology, Pediatrics, Nephrology, and Others the error categories are reported as follows, “No error” cases were seen in Gastroenterology with (11), followed by Pediatrics with (29), and Nephrology with (10) and Others with (9) cases.

In “Error No Harm”, with Pediatrics reporting (51), followed by Nephrology with (31), Gastroenterology with (12), and Others with (23) cases. In “Error Harm” category the highest occurrence in Nephrology (3) and Others (3), in pediatrics reported (2) and Gastroenterology with (1) cases. There were “no Error deaths” across all categories in any of the Departments.

**Table 3: Profession Related Error.**

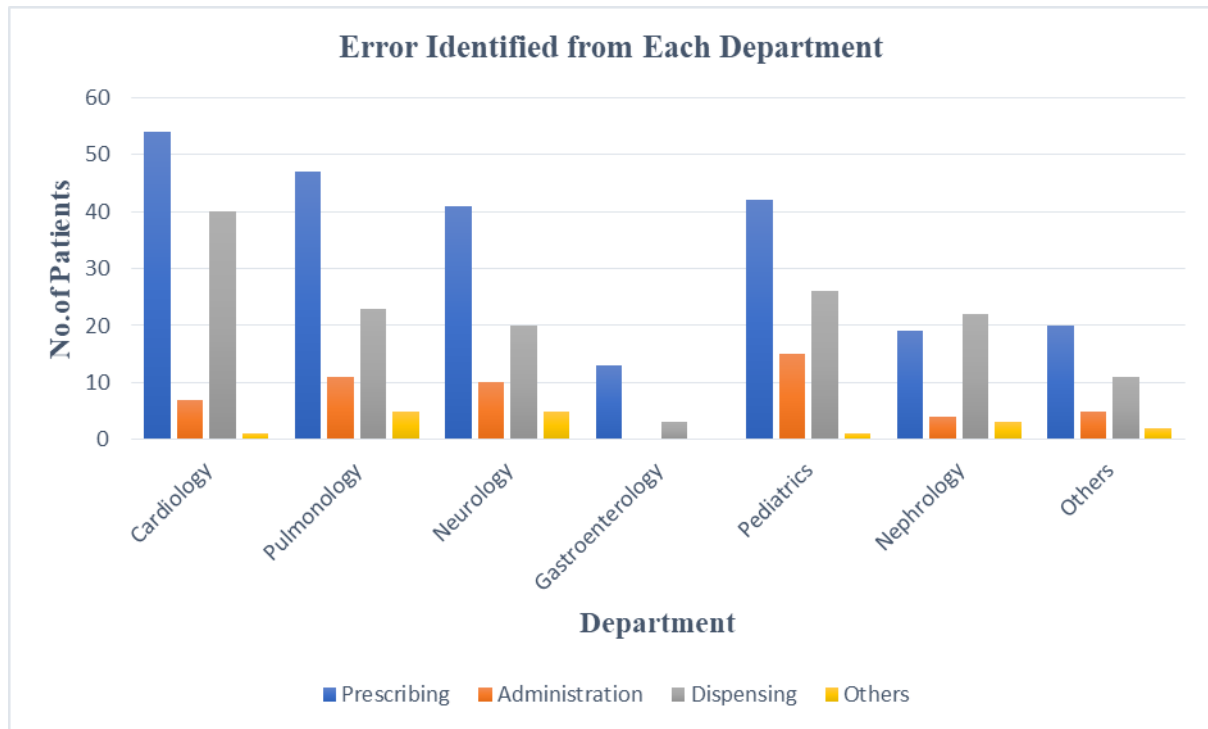
Type of Medication Error	Omission	Wrong Drug/Dose/Dosage/Route	Incorrect Directions	Others
Cardiology	35	57	5	3
Pulmonology	38	47	2	5
Neurology	33	45	0	0
Gastroenterology	3	11	0	0
Pediatrics	33	50	2	2
Nephrology	21	20	1	2
Others	16	19	0	0

In the medical divisions of Cardiology, Pulmonology, and Neurology, the predominant category of error was Wrong Drug, Dose, Dosage, or Route, with cases in Cardiology having the greatest number (57), followed by Pulmonology (47) and Neurology (45). Omission errors were noticeable in Pulmonology with (38), then followed by Cardiology with (35) and lastly, Neurology with (33) cases.

Errors pertaining to Incorrect Directions were rare in Cardiology (5) and Pulmonology (2), while Neurology did not have any such errors. In addition, Other medication errors were noted in Cardiology (3) and in Pulmonology (5) and was not recorded in the Neurology Department.

In Gastroenterology, Pediatrics, Nephrology and Others, the most common medication error was Wrong Drug, Dose, Dose or Route, Pediatrics had (50), Gastroenterology had (11), Nephrology had (20) and Others reported with (19). Omission errors were most common in Pediatrics with (33), Nephrology with (21), Gastroenterology with (3) and Others with (16) cases.

Incorrect direction in Pediatrics with (2) and Nephrology with (1) case, Gastroenterology and Others had none. Others medication error occurs in Pediatrics (2) and Nephrology with (2) cases.



**Figure 1: Error Identified from Each Department.**

A total of (54) prescribing Errors were done in the Cardiology department, a total of (7) for administration, (40) for dispensing, and (1) for other activities. In Pulmonology, (47) prescribing Errors were reported, (11) for administration, (23) for dispensing, and (5) for other activities.

Neurology had reported (41) prescribing Errors, (10) for administration, (20) for dispensing, and (5) for other activities. Gastroenterology had reported (13) prescribing Errors, none for administration, (3) for dispensing, and no other activities.

In Pediatrics, (42) prescribing Errors were reported, (15) for administration, (26) for dispensing, and (1) for other activities. Nephrology made (19) prescribing Errors, (4) for administration, (22) for dispensing, and (3) for other activities. Lastly, the "Others" category accounted for (20) prescribing (5) for administration, (11) for dispensing, and (2) for other activities.

## RESULT AND DISCUSSION

This study was to evaluate medication errors in Tertiary hospital departments based on pharmacists' reports. A number of interventions can be provided to increase the reporting of medication errors by healthcare professionals in hospitals, including criticizing reporting, conducting audits and providing feedback, providing education, engaging professional health workers, and delegating responsibilities.<sup>[6]</sup>

In terms of age distribution, (37%) of medication errors occurred in patients aged 40–60, most of whom were males (63%). In previous studies, most patients who experienced medication errors were between 19 - 59 years of age, most of them are Females which differs from this result.<sup>[7]</sup>

Prescribing error is the most frequent type of medication error occurred in departments like Cardiology, Pulmonology, Neurology, Nephrology, Gastroenterology, Pediatrics, and other departments about (50%) of these include unclear writing, dosage forms not written down, incorrect or incomplete instructions for use, dosage, number of drugs and dosage strengths, drug duplication in a single prescription, potential drug interactions, and inappropriate dosage for clinical use by the patient. In contrast to our Study, the Prescribing Error was found to be (22.38%) which is least from this result.<sup>[8]</sup>

The second most common medication error was in the Administration process which is (35%). These errors can be prevented by rechecking the prescription with the prepared medication before handing it to the patient. Further, other medication errors were also identified in this study, including the Dispensing error of (11%) reported in various Departments like Cardiology, Pulmonology, Neurology, Nephrology, Gastroenterology, Pediatrics. In previous studies, the Administration Error was found to be (36.5%) and the Dispensing Error was to be (14.3%) which varies from this result.<sup>[9]</sup>

The majority of error in patient of Cardiology department (22.2%), (18.6%) of Pulmonology department, (16.6%) of Neurology, Pediatrics department in (18.6%), (3%) of Gastroenterology department, (9.7%) of Nephrology department and (7.7%) of other departments were reported. In other studies, it differs from this result for each department.

## CONCLUSION

The prospective observational study conducted in a tertiary care hospital in Erode for three months. The medication error was found in a sample size of 450 patient's data. Errors were classified based on their types, prescribing error (highest), administrative error, dispensing error, and others. The reasons behind the error occurrence and the source of error was investigated and found that 44% of medication error were caused by nurses, and 42% of error were caused by physician. This may be due to a high workload, negligence, or maybe due to lack of knowledge, experience.

From the collected data the cardiology department occurred the highest error and by the following pulmonology and other departments like Pediatrics, Neurology, Nephrology and Gastroenterology are takes place. Medication error is a preventable error that can be reduced by providing proper education and training to a healthcare professional.

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