International Journal of Pharmacy and Biological Sciences
ISSN: 2321-3272 (Print), ISSN: 2230-7605 (Online)
IJPBS | Volume 8 | Issue 3 | JUL-SEPT | 2018 | 112-121
Case Report | Biological Sciences | Open Access | MCI Approved| ज्ञान-विज्ञान विमुक्तये
|UGC Approved Journal |

STUDY OF ANALYSIS AND PATTERN OF MEDICATION ERRORS IN INPATIENTS DEPARTMENT

[1]*Shete Shivkumar Kashinath* and [2]K. Sattanathan
[1]*Research scholar Mewar University Rajasthan
[2]Research Supervisor Mewar University Rajasthan

***Corresponding Author Email: drshivkumar999@gmail.com**

ABSTRACT

According National Coordinating Council for Medication Error Reporting and Prevention (NCC MERP), the medication error is any preventable event that may cause or lead to inappropriate medication use or patients hazards while the medication is in control of HCP[1]. The drug delivery is a complex and errors can take place at any place at any level from prescribing of drug to administration of drug [2]. A total of 3359 cases of the patients were screened, 497 Out of 259 (52.11%) cases of male and 238 (47.88%) were females and highest number of the medication errors were identified in age group 46-60 years 199 (40.04%). A total 497 medication error were observed among them 219 (44.06%) were errors in prescribing medication errors, 184 (37.02%) were transcription error and 79 (15.89%) were administration errors, the dispensing errors found lowest in this study that is 15 (3.01%) highest no of medication errors were done by physicians 383 (77.06) % due to Nurses were 99 (19.01%) of medication errors happened and Pharmacists is responsible for lowest medication errors that is 15 (3.01%) . The causes for prescribing errors were due to 121 (55.25) % due to illegible handwriting, in transcription errors 93 (50.54%) due to omit the key information were in administration error 21 (26.58%) due to omission error, in dispensing errors 7 (46.66 %) due to dispensing wrong drug. Majority of medication error were belonging to antibiotics148 (29.77%). On evaluation of severity, majority of medication errors, 373 (75.06%) were classified in No harm category followed by were in category of No error 124 (24.94%). The study concluded that majority of medication error were detected during study period by clinical pharmacist intervention and revealed that pharmacist can play a major role in preventing these errors by early detection.

KEY WORDS

Medication errors, Prospective, Severity

INTRODUCTION:

The detected or identified medication errors need to documented and studied because doing so will facilitate about error avoidance, advance understanding of the short lapses and interferences that lead to error and help to maintain public confidence in the health care system[3]

The main aim of medication therapy is achieving specific therapeutic clinical outcomes to improvement in a patient's quality of life and disease status while minimizing potential risk. There are both known and unknown risks associated with the therapeutic use of prescription and nonprescription OTC drugs and drug administration devices. These risks and their associated danger have been defined as drug misadventures. These include both adverse drug events and Medication errors.[4]

The time came when we need to think about to quantify the problem of medication errors and take necessary steps to improve the quality health care system. The various types of these errors should be identified, to reduce the incidence of medication errors and improve the pharmaceutical care. Medication

errors can be collected by extraction from practice data, incident reports from health professionals, and patient surveys. Practice data include charts, laboratory, and prescription data. Investigating the incidence, type, and nature of medication errors are very crucial to prevent them.

The purpose of present study was to identify and evaluate the incidence and types of errors and to assess the severity of medication errors in Medicine Department of tertiary care teaching hospital.

METHODOLOGY:

Study setting:

The study was carried out at in-patient all clinical department of medicine and surgery at Global tertiary care hospital, Hyderabad.

Study Design: It was a simple prospective observational study in this type of study in which patients receiving medication during treatment were studied[5] .

Study period: It was a prospective type of study initiated from March 2015 to March 2018

Study criteria: Patients of Medicine Department were enrolled into the study by considering following criteria:

Inclusion Criteria:

- Case sheets of Patients who admitted to hospital in any department.
- Patients who were willing to participate in the study.
- Case files of the all patients admitted between periods of March 2015 to March 2018 were referred.

Exclusion Criteria:

- Patients who refused to take medication.
- Patients who were not willing to participate in the study

Source of data: Hospital and medical patient case records, Case sheet of the inpatient who got admitted in hospital.

Study Materials:

- Patient Profile Form (Includes patient prescription and administration details)
- Medication error reporting and documentation form.
- NCCMERP guidelines.[5]

Ethical Approval:

Ethical clearance was obtained from the local Human Ethical Committee of Sree Dattha Institute of Pharmacy MOU with Global Hospital Hyderabad. Approval No: (SDIP/IEC/2015/101)

RESULTS:

During the study period of total of 3359 patients were screened in the hospital. Out of which 497 patients encountered medication errors.

Table 5.1 shows details of the encountered medication errors are reported gender-wise distribution of medication errors

TABLE No 5.1 GENDER- WISE DISTRIBUTION OF MEDICATION ERRORS (N=497)

SL. NO	Gender	No. of Medication Error Cases	Percentage (%)
1	Male	259	52.11 **%**
2	Female	238	47.88 **%**
*	Total	**N=497**	100 %

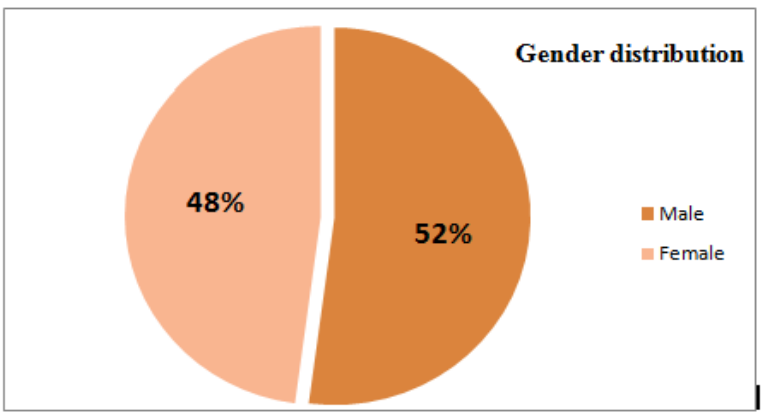

Figure no 5.1: Gender-wise distribution of Medication Errors

Table no 5.2 Patients Demographics: age (n=497)

Sr. No	Age	No.of Patients	Percentage (%)
1	<18	23	4.62 **%**
2	19-30	79	15.89 **%**
3	31-45	175	35.21 **%**
4	46-60	199	40.04 **%**
5	61 above	21	4.22 **%**
*	**Total**	**N=497**	**100 %**

Table No 5.2 and Figure 5.2 shows age distribution of the patients who had encountered at the study site. The data revealed that, the maximum number of patients, 199 (%) who had encountered for medication errors during the study period were in the age group above 46-60 years.

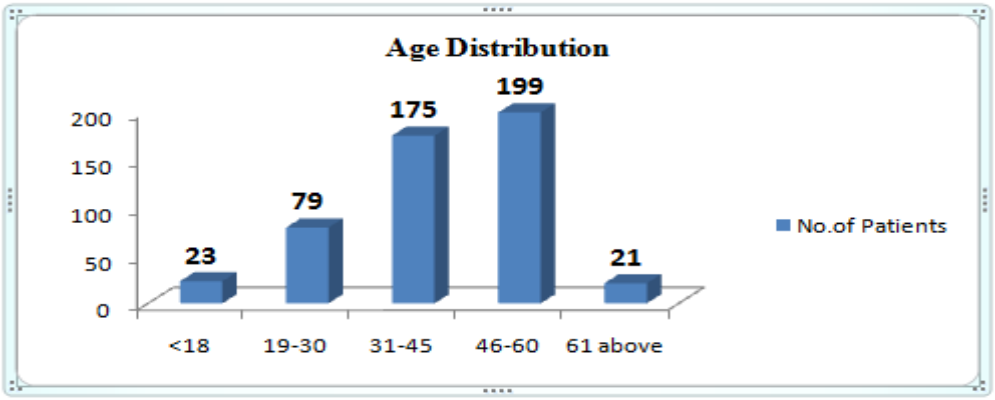

Figure no 5.2 Patients Demographics : Age

Table no 5.3: Types of Medication Errors (n= 497)

Sr.No	Types of Medication Errors	No of Medication Error	Percentage (%)
1	Prescribing error	219	44.06 %
2	Transcription error	184	37.02 %
3	Administration error	79	15.89 %
4	Dispensing error	15	3.01 %
*	**TOTAL**	**N=497**	**100 %**

Table 5.3 shows details of the encountered various types of medication errors are reported and its distribution of medication errors, Transcription error (184) is found highest in numbers.

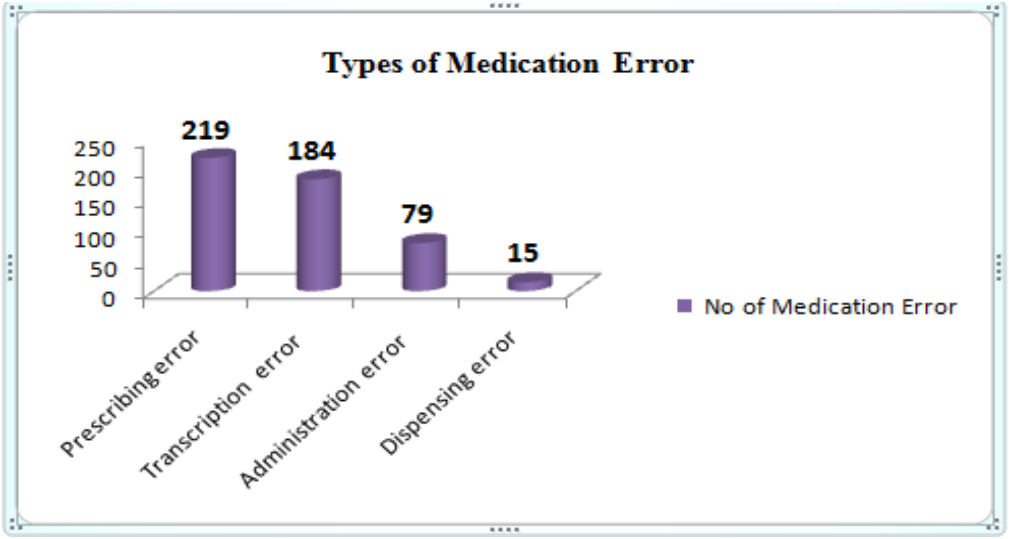

Figure no 5.3: Types of Medication Errors

Table no 5.4: Professionals involved in medication errors (N=497)

sr. no	Professionals involved	No of Medication Errors	Percentage (%)
1	Nurses	299	60.21 %
2	Pharmacists	15	3.01 %
3	Physicians	183	36.82 %
*	**TOTAL**	**N=497**	**100 %**

Table 5.4 shows details of the encountered professionals involved in contribution medication errors physician are the responsible for highest medication errors.

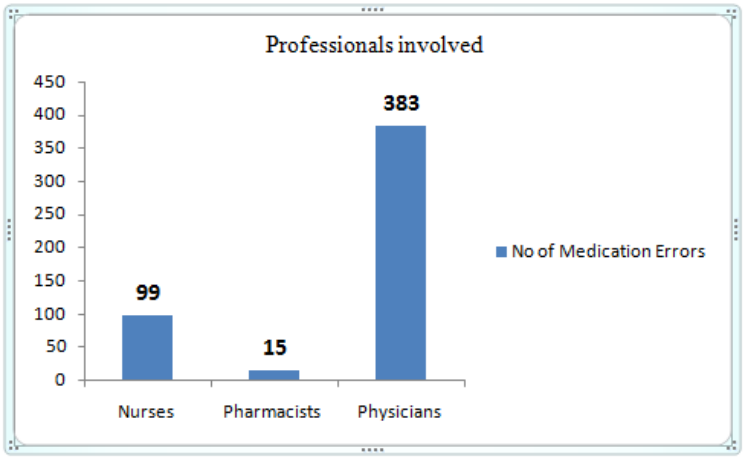

Figure no 5.4: Professionals involved in Medication Errors (n=497)

Table no 5.5: causes of Prescribing Errors (N=219)

SR. NO	Prescribing errors	Number of Errors Observed	Percentage (%)
1	Illegible handwriting	121	55.25 %
2	Wrong Brand name prescribed	25	11.49 %
3	No dose prescribed	9	4.10 %
4	No frequency prescribed	5	2.28 %
5	Class duplication	26	11.87 %
6	Wrong Route	6	2.73 %
7	Wrong Dose error	27	12.32 %
*	**Total**	**192**	**100 %**

Table 5.5 shows details of the reasons which is caused prescribing errors and Illegible handwriting causing highest no of prescribing errors.

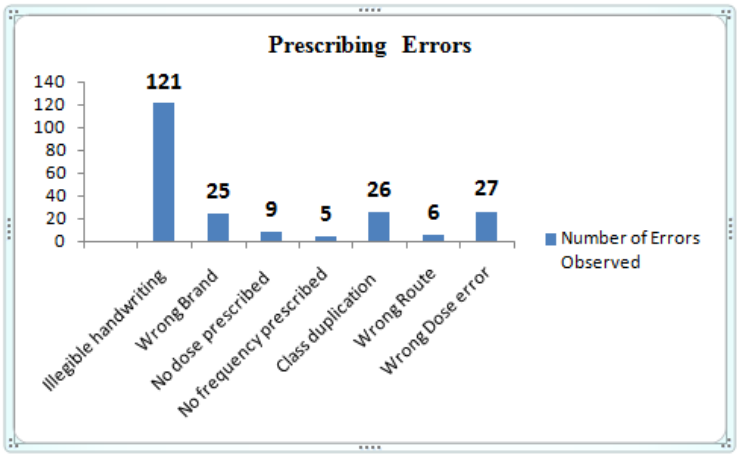

Figure no 5.5: causes of Prescribing Errors (n=219)

Table no 5.6: causes of Transcription Errors (N=184)

SR. NO	Transcription errors	Number of Errors observed	Percentage (%)
1	Omit the key information	93	50.54 %
2	Re write dose, frequency, ROA, etc	14	7.60 %
3	Illegible handwriting	39	21.19 %
4	Missing new order	28	15.21 %
5	Not transcribed stop order	10	5.43 %
*	**Total**	**N=184**	**100 %**

Table 5.6 shows details of the reasons which is caused transcription errors and Omit the key information is causing highest no of transcription errors.

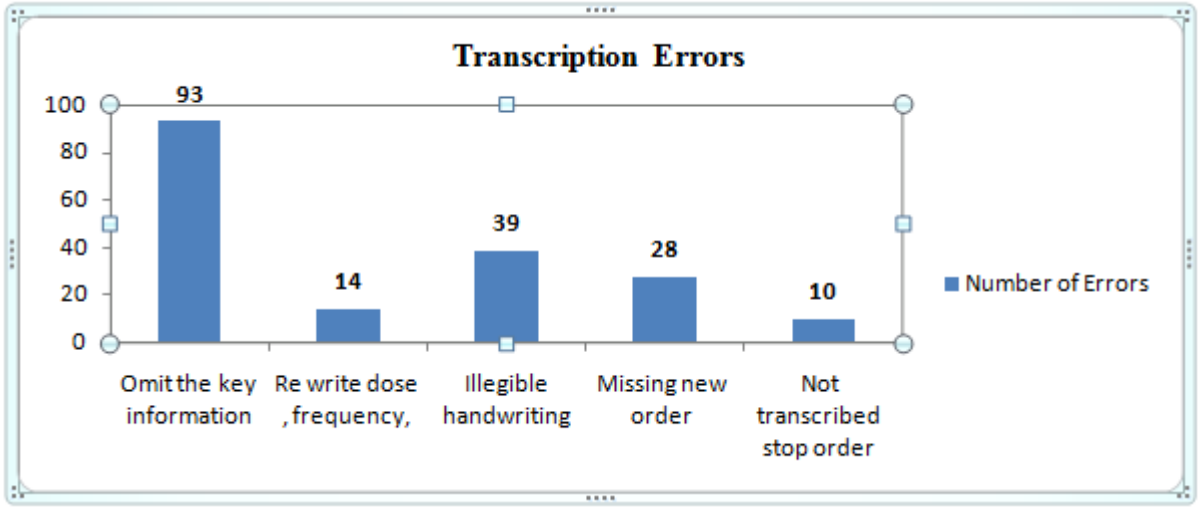

Figure no 5.6: causes of Transcription Erors (n=184)

Table no 5.7: causes of Administration **Errors (n=79)**

SR. NO	Administration Errors	Number of Errors observed	Percentage (%)
1	Omission error	21	26.58 %
2	Unauthorised drug	8	10.12 %
3	Wrong dose	7	8.86 %
4	Wrong time	16	20.25 %
5	Wrong route	3	3.79 %
6	Wrong frequency	9	11.39 %
7	Wrong patient	1	1.26 %
8	Forget to reset infusion pump	9	11.39 %
9	Preparing Incorrect infusion solution	5	6.32 %
*	**Total**	**N=79**	**100 %**

Table 5.7 shows details of the reasons which is caused administration errors and Omission error is causing highest no of administration errors.

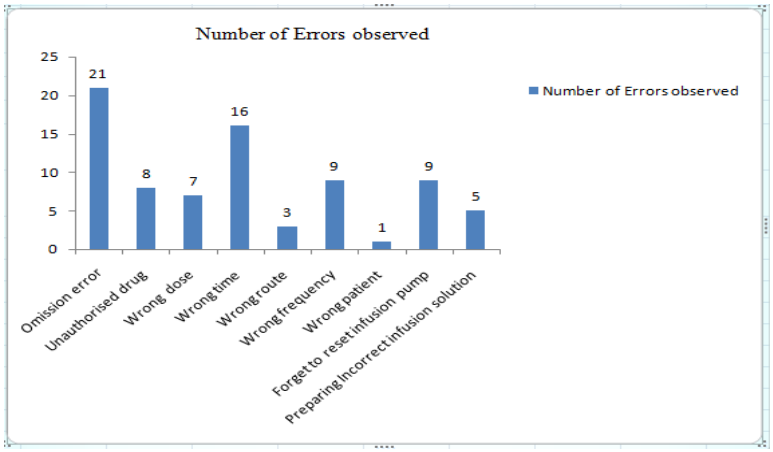

Figure no 5.7: causes of Administration **Erors (n=79)**

Table no 5.8: causes of Dispensing Errors (n=15)

SR. NO	Dispensing Errors	Number of Errors observed	Percentage (%)
1	Dispensing wrong drug	7	46.66 %
2	Dispensing wrong dose	3	20.00 %
3	Poor drug storage practice	1	6.66 %
4	Incorrect labelling	3	20.00 %
5	Dispensing too late	1	6.66 %
*	**Total**	**N=15**	**100 %**

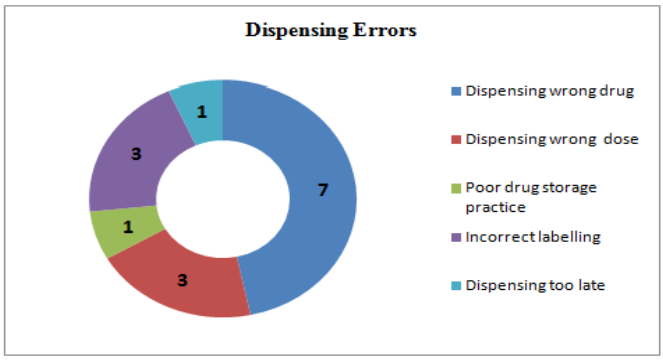

Figure no 5.8: causes of Dispensing **Errors (n=15)**

Table no 5.9: Factors affecting contribution of medication errors by HCP

SR. NO	Factors involved	Number of Errors observed	Percentage (%)
*	**Medication Errors by Nursing Staff**	**(N=99)**	***
1	High work load	53	53.53 %
2	High activities and stressed	25	25.25 %
3	Misinterpretation prescription	8	8.08 %
4	Illegible prescription	7	7.07 %
5	Improper training	6	6.06 %
#	**Medication Errors by Pharmacist**	**(N=15)**	***
1	Illegible prescription	2	13.33 %
2	Poor drug distribution practice & storage	2	13.33 %
3	High work load	5	33.33 %
4	Improper training	3	20.00 %
5	Misinterpretation prescription	1	6.66 %
6	Similar drug and brand name	2	13.33 %

#	Medication Errors by physician	(N=383)	***
1	High work load	219	57.18 %
2	High activities and stressed	94	24.54 %
3	Misinterpretation prescription	61	15.92%
4	Improper training & experience	9	2.34 %

Table 5.10: levels of Severity of Reported Medication Errors

Level of severity		Number of Medication Errors (N=497)	Percentage (%)
No Error	Category A	124	24.94 **%**
Error, No harm	Category B	164	32.99 **%**
	Category C	188	37.82%
	Category D	21	4.22%
Error, harm	Category E	0	
	Category F	0	
	Category G	0	0.00
	Category H	0	
Error, Death	Category I	0	0.00

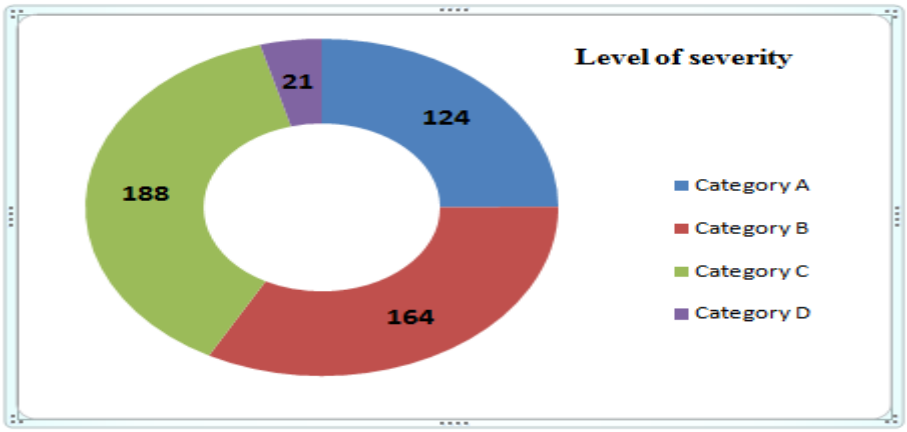

Figure 5.11: levels of severity of reported medication errors

DISCUSSION:

A medication error is a number of sets associated with use of medication that should be preventable through effective systematic control standard procedure. The factor which are contributing enhancing the chance of medication errors are the due to the complex procedure involved in the prescribing, dispensing and administration of drugs at various levels. Many authors have reported standard operating procedure for reducing medication error include reduced reliance on memory, improved asses to drug information, simplification, standardization and training. Substantial evidence suggests that pharmacists in decentralized patient care setting can reduce the frequency of medication errors.

The demographic reports of our study showed high incidence of medication errors in female 238 (47.88%) over males 259 (52.11%) similar results were observed with study conducted by **Shah CN and Solanki N**.[7] This may be attributed to fact that more number of patient cases selected for study were females 161(53.67%) over males 139(46.33%) as shown in **Table 5.1; Figure 5.1**

Our study also found higher incidence of medication errors in age group between 46-60 years 199 (40.4%) as shown in **Table no. 5.2 & Figure 5.2**. This can be attributed to the fact that more number of patients visited the hospital during study period was also ranged between 46-60 years of the age groups as shown in **Table no. 5.2 & Figure 5. 2.** Similar results were observed in the study conducted by **Leelavati D. Acharya et al**[38] but the study conducted by

Massachusetts Board of registration in pharmacy[12] showed higher incidence of medication errors in patients ranged between 31-40 years of age.

Our study showed that out of 497 cases various types of medication error, prescribing error caught maximum 219 (44.06%) followed by transcription errors 184 (37.02%) administration error 79 (15.89%) and dispensing error are 15 (3.01%)

as shown in **Table 5.3 & Figure 5.3. The** study conducted by **Shah CN & Solanki N**[7] showed that prescription errors are the most common among all types of errors which was also supporting for study results of higher numbers of prescribing error.

Out Of the total 497 various types of medication error detected in our study, 383 errors (77.06%) were due to Physician, also 99 (19.91 %) were due to Nurses and 15 (3.01%) were due to physicians as shown in **Table 5.4 & Figure 5.4** Another study conducted by **Karna et al** showed that major error were due to nurses 61.6% followed by pharmacists and physicians.[8]

Cause analysis for different types of medication errors were carried out and were given in **Table no. 5.5, 5.6, 5.7, 5.8 & Figure no 5.5, 5.6, 5.7, 5.8 respectively**.

Out Of 219 (44.06 %) prescribing errors factors responsible for errors were illegible handwriting carry for 121 (55.25%), wrong brand name prescribed accounts for 25 (11.49%), no dose prescribed error 9 (4.10 %), no frequency prescribed 5 (2.28%), class duplication 26 (11.87 %) and wrong route of drug administration prescribed carry for 6 (2.37 %) in prescribing errors. Our results highlight that class duplication 26 (12.32 %) as major prescribing errors whereas **Shah CN and Solanki N**[7] study showed no dosage form prescribed as major prescribing error.

The total 184 (37.02%) transcription errors observed, highest reason for transcription errors is omit the key information that is 93 (50.54%), followed by illegible handwriting 39 (21.19%) and missing new order 28 (15.21%).

The total of 79 (15.89 %) administration errors observed, omission error were 21 (26.58%), followed by wrong time/dose delay 16 (20.25%) and wrong frequency 9 (11.39%).

The total of 15 (3.01%) dispensing errors observed, dispensed wrong drug accounts for 7 (46.66%) and wrong dose dispensed carry for 3 (20.00%).

The majority of the medication errors observed in antibiotics 148 (29.77%), followed by antihypertensive 54 (10.86 %) NSAID 49 (9.85%) as shown in

Table 5.10 & Figure 5.10. The findings were consistent with the other Indian studies

Karthikeyan M and Lalitha D[6] **and Reddy P and Mandha M.**[10]

NCCMERP proposed medication error index was used to assess the severity of medication errors. It was found that the No Medication Errors, sub category A 124 (24.94%) belonged to the category, Error No harm which comes under sub-category B 164 (32.99%), sub-category C 188 (37.82%) and sub-category D 21 (4.22%) in this category as shown in **Table 5.11 & Figure 5.11.**

CONCLUSION:

Clinical pharmacist intervention is very important for dealing with incidences of detecting and preventing of medication errors for improving the quality of medical and pharmaceutical.

"This helps to ensure that the right patient is receiving the right drug in the right dose by the authorized clinician".

This present research study clearly seen that the need of a clinical pharmacist to work dedicatedly at the inpatient ward and need to develop standard operating procedure for prevention of medication errors also continues changes and updating of hospital formulary, protocols and prescription policies in hospital.

Future prospective studies should be planned to detect and prevent of medication errors it would change in patient therapy guidelines. All the patients are interviewed by the clinical pharmacist at the time ward round when guidelines and protocols are implemented.

The results will be a better to the fact that a ward-based clinical pharmacist can prevent negative consequences related to medications.

In Indian hospitals we need to develop standard system for rational and safer use of medication and we are as a developing health care system lacing with this so we must implement a standard heath care system where errors must compulsory detected, reported and prevented.

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Received:05.05.18, Accepted: 07.06.18, Published:01.07.2018

***Corresponding Author:**
Shete Shivkumar Kashinath*
Email: drshivkumar999@gmail.com