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IMPACT OF MEDICATION ERRORS WITH SPECIAL FOCUS ON NURSING INVOLVEMENT IN PATIENT SAFETY: STRATEGIES TO PREVENT THEM

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ABSTRACT

Background: Medication errors are a common cause of iatrogenic adverse events, leading to morbidity, prolonged hospital stay and mortality. Over 1.3 million people per year are injured by medication errors committed by healthcare professionals. **Aim:** Our aim is to ascertain the impact of medication errors on patient safety and the quality of clinical care services and to reduce the risk of their occurrence through the application of various preventive strategies. **Materials and Methods:** A prospective observational study was conducted for a period of 3 months in a tertiary care hospital. In the study, about 1061 prescriptions were audited from all the in-patient departments and documented in a prescription auditing form. **Results:** A total of 345 medication errors were reported, out of which, highest number was constituted by documentation errors (210). About 49 errors reached the patient. A majority of the errors were committed by the nursing staff with less than one year of experience. The adoption of various strategies had reduced the medication errors in ICU from 9% to 2%, but remains the same in wards. **Conclusion:** All the health care professionals have a responsibility in the identification and reporting of medication errors and to put forward strategies to prevent them. Staff nurses should be highly competent in all aspects of the standards of care for medication management. The proficiency of a nurse in the standard care of medication management determines her ability to handle the factors leading to medication error occurrence.

KEYWORDS: Medication errors, Documentation, Patient safety.

INTRODUCTION

The United States National Coordinating Council 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 healthcare professional, patient, or consumer. Such events may be related to professional practice, healthcare products, procedures, and systems, including prescribing, order communication, product labelling, packaging, and nomenclature, compounding, dispensing, distribution, administration, education, monitoring, and use".[1]

Prescribed medicines are the most frequent treatment provided to patients. The five rights of safe and effective medication management are defined as the right medicine given to the right patient at the right time, in the right dosage form and at the right dose.[2] All healthcare professionals involved in medicine management are governed by legal and professional accountability to follow best practice when prescribing and administering medications. This is necessary to ensure safe and effective patient care. Drug administration is a multi-professional process, which involves prescribing, preparation and administration of medications to the patient. It has been shown that interruptions can contribute to administration errors whereas illegible handwriting and improper use of abbreviations can also lead to serious medication errors.[3-5]

Patient care documentation in health care settings assumes enormous importance with the current emphasis on quality of care. Nursing documentation provides evidence of interventions, patient response, and evaluation of care. It is a source of communication between nurses and other health professionals, which facilitates awareness of the patients' current health status. Various forms of documentation exist including vital sign assessment charts, medication charts, and pathology result charts. Progress notes comprise a synthesis of this information from different health professionals' perspectives about the patient's condition, enabling on-going collaboration and interdisciplinary decision-making. Compared with other forms of documentation, nurses' progress notes provide the most scope for open expression of clinical judgment.[6] Medication errors determinedly affect patient safety, hospital costs and candor of the nursing profession. A proper insight into the contributing factors of medication

errors is the first step towards their prevention. The longer hospital experience and proficiency of a nurse in the standards of care on medication management will enhance the ability of the nurse to handle factors contributing to medication errors. Medication errors are a significant issue affecting patient safety and hospital costs, often leading to dangerous consequences for the patients. It is essential to realize that an analysis of factors causing medication errors can help healthcare professionals to identify the reason behind the occurrence of medication errors and to provide insights to make improvements to prevent their recurrence. The study will explore the relationship between the level of competency of staff nurses and the factors affecting medication errors, which thereby greatly enhances patient safety and reduce healthcare costs.[7]

To expedite the development of strategies for reducing errors, it is necessary to identify where within the system the problems lie. The technique of direct observation has proved to produce valid and reliable results in identifying medication errors and has many advantages over the other techniques. It allows data to be collected with greater objectivity, thereby reducing the possibility of assumptions being drawn.[8] It has the advantage of being easily understood and views the medication errors as errors in the system and does not assign blame. But it is expensive and requires special training for observers. Therefore, documentation review is less expensive and has proved to be useful in detecting medication prescribing errors and poorly written prescriptions.[9,10]

MATERIALS AND METHODS

A prospective observational study through regular random prescription auditing was conducted in a tertiary care hospital for a period of 3 months (March 2019 – May 2019). A total of 1061 prescriptions were audited during the study period for the identification of medication errors by the review of all patient case files from the In-patient department including both ICU and wards. Out-patient and emergency departments were excluded from the study. The medication errors were detected from patient case files, through direct observation and by self-reporting by the healthcare professionals. The patient case files were audited in a prescription auditing form and reviewed for the medication errors, which was then reported using a medication error reporting form. The study also focussed on the nursing involvement in the medication errors which were audited and analysed. All identified medication errors were reported to the concerned department of the hospital and educated the healthcare professionals about the factors contributing to the occurrence of medication errors. The percentage was then calculated using Microsoft Excel 2010 sheet and also compared the percentage of medication errors before and after the adoption of strategies to prevent them.

RESULTS

Our study analyses the impact of medication errors on the patient safety and quality of clinical care services and the strategies to prevent them. The study was conducted for a duration of 3 months (March, April and May - 2019). In the present study, we have randomly audited a total of 1061 patient case files. 326, 349 and 386 files were audited in the months of March, April and May, respectively. A total of 345 medication errors were reported to the clinical pharmacology department of the hospital. Out of these, 106 errors were audited in the month of March, 118 errors were audited in the month of April and 121 errors were audited in the month of May (Table 1 and Table 2).

Table 1: Number of patient case files and medication errors audited in respective months.

Sr. No.	Month of auditing	Number of audited patient case files	Number of audited medication errors
1.	March	326	106
2.	April	349	118
3.	May	386	121
4.	Total	1061	345

Table 2: Number of different types of errors audited in respective months.

Sr. No.	Medication errors	March	April	May
1.	Prescription	19	15	13
2.	Administration	6	14	14
3.	Dispensing	12	1	0
4.	Monitoring	0	0	0
5.	Documentation	62	67	81
6.	Transcription	7	21	13
7.	Total	106	118	121

In the study, we categorised the medication errors as errors reached to the patient and near missed errors, i.e. errors occurred but not reached to the patient. Out of 345 errors reported, a total of 49 medication errors reached to the patients in the 3 months period and 296 were near missed errors. Out of 49 errors reached to the patients, 34 administration errors, 3 transcription errors and 12 dispensing errors were found (Fig. 1).

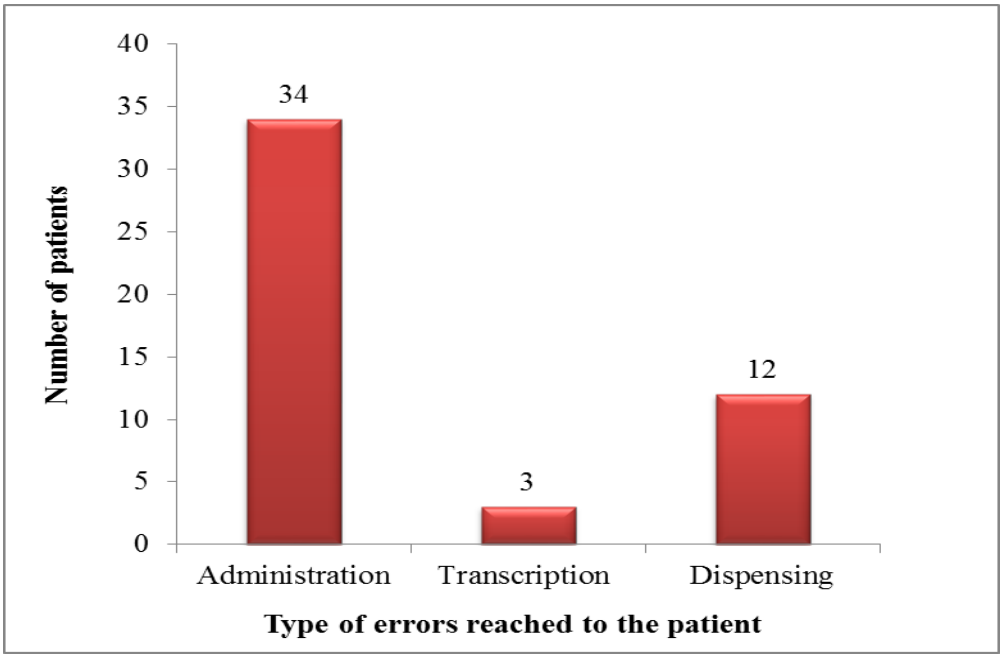

Figure 1: Segmentation of medication errors reached to the patients.

Among the overall medication errors, a total of 6 errors were self-reported by the nursing staffs in the first 2 months and no self-reporting was observed in the third month. During the study, medication errors were segmented on the basis of staff involved and it was observed that nursing staffs were involved in maximum number (Fig. 2).

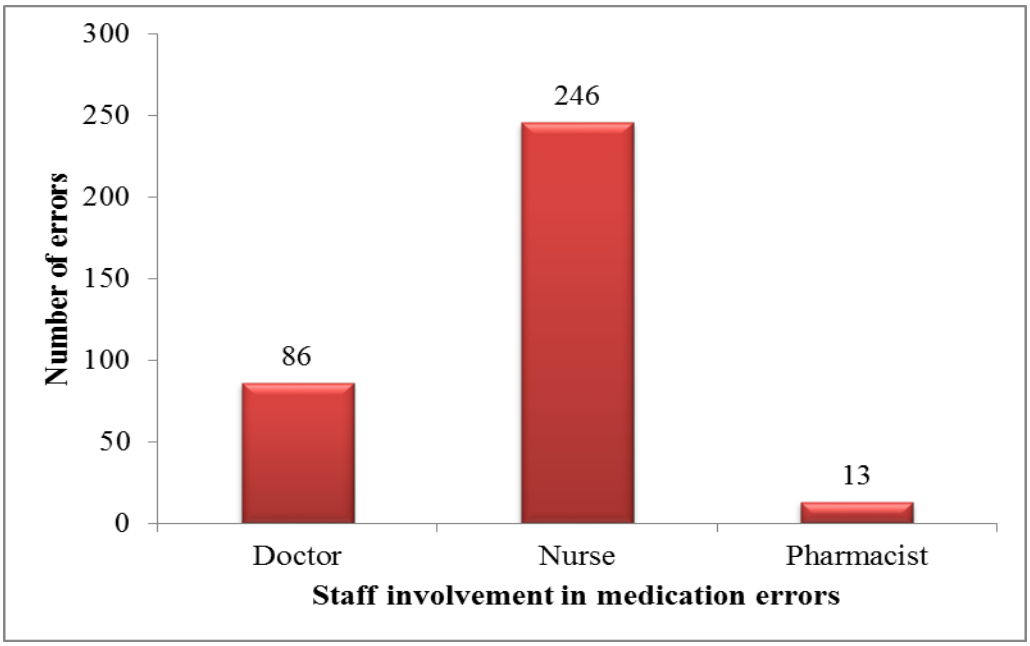

Figure 2: Staff wise Medication error categorization.

Out of 345 medication errors audited, documentation errors were mostly observed, which was the main reason for the marked involvement of nursing professionals in the occurrence of errors. The documentation errors were identified as drug documentation done without administration within the time and drug documentation not done after administration. These do not reach the patient but these are a major contributing factor that can cause harm to the patient. In the study, a total of 210 documentation errors were found, out of which, 18 errors belongs to the former category and 192 errors belongs to the latter (Fig. 3).

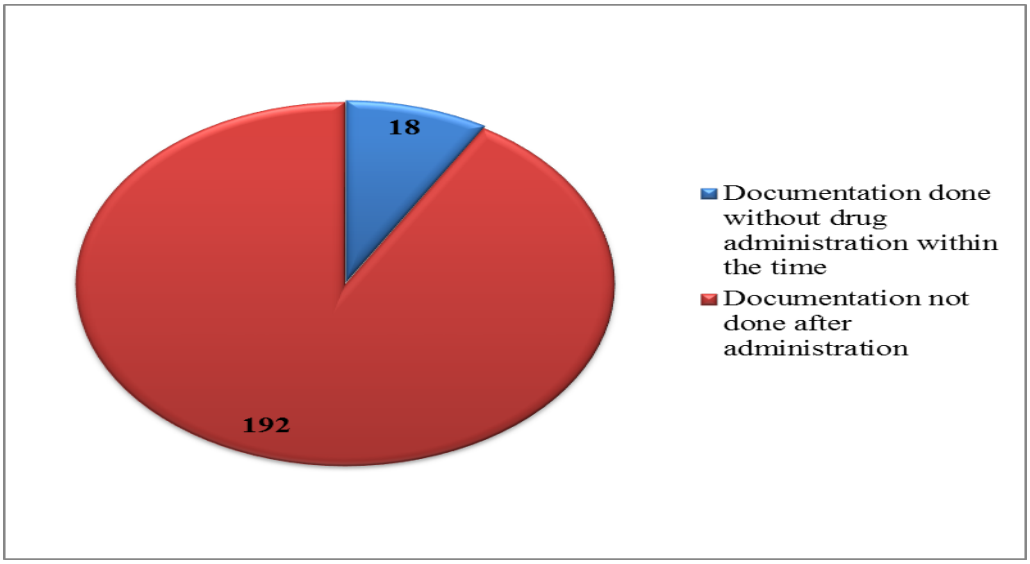

Figure 3: Categorization of documentation errors.

Out of all medication errors (345) captured: maximum was the documentation errors (210), followed by administration errors (34) and then transcription errors (2). Experience of the nursing staffs who were involved in the documentation as well as administration errors were analysed and categorised their experience as follows:

- Experience less than 1 year
- Experience less than 5 year
- Experience more than 5 year

The study showed that the most of the medication errors were committed by nursing staffs with less than 1 year experience (143), followed by staffs with less than 5 years' experience (83) and fewer errors were committed by nursing staffs with more than 5 years' experience (24) (Table 3).

Table 3: Experience of nursing staffs involved in medication errors.

Sr. No.	Experience	Number of nurses involved in medication errors
1.	Less than 1 year	143
2.	Less than 5 years	83
3.	More than 5 years	24

After adopting various interventions for minimizing the occurrence of medication the percentage got reduced in ICU to 2% from 9% whereas ward is still a challenge due to various reasons (Fig. 4 and Fig. 5).

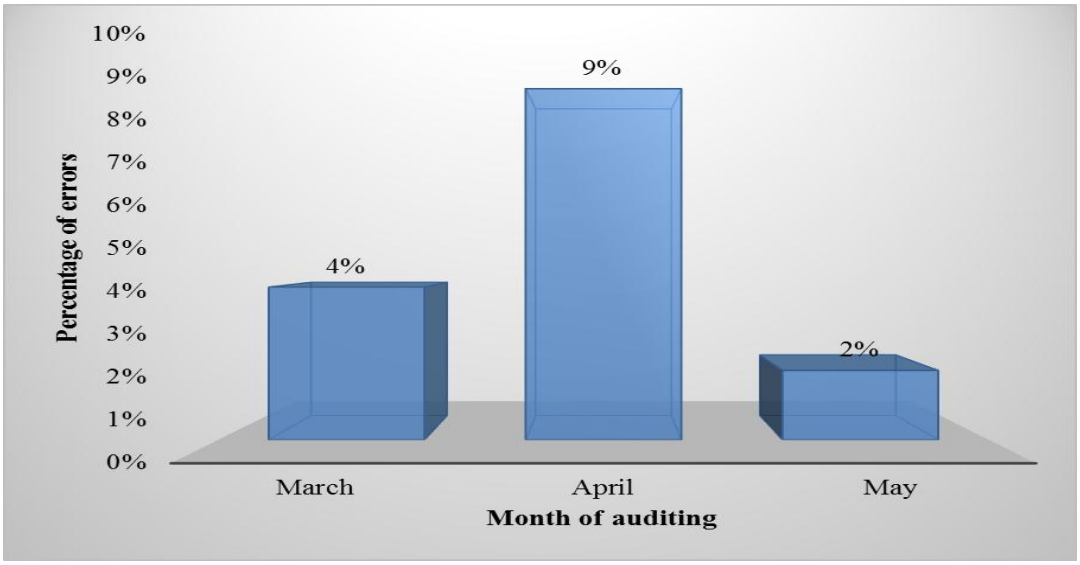

Figure 4: Percentage of medication errors in ICU in respective months.

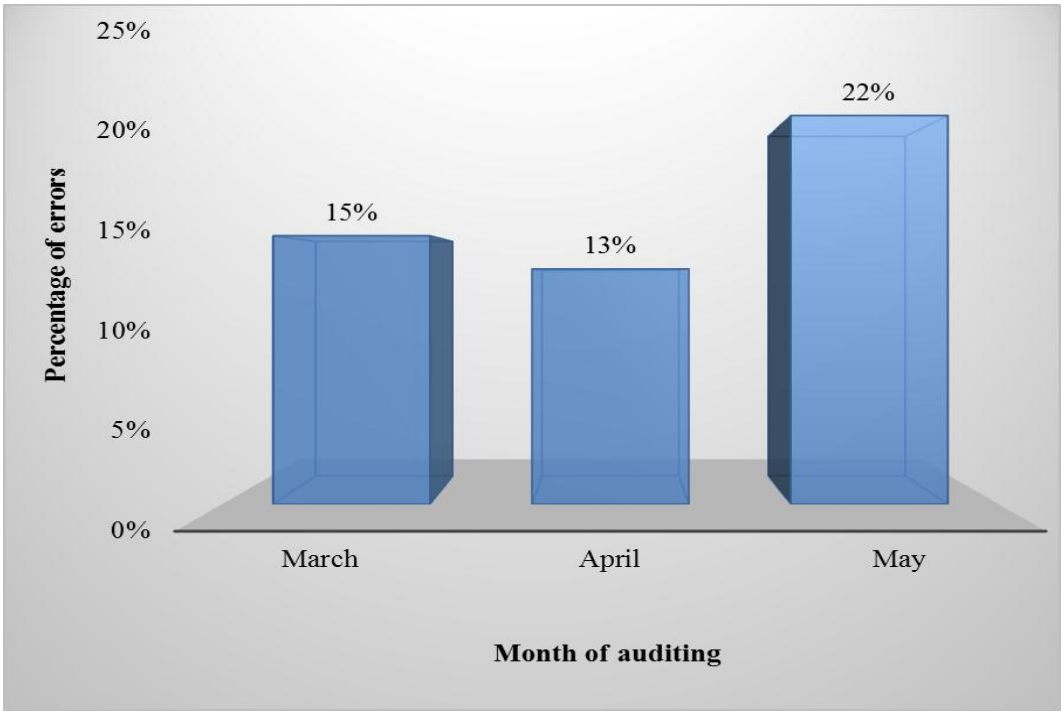

Figure 5: Percentage of medication errors in wards in respective months.

DISCUSSION

The present study was done to analyze the occurrence of various types of medication errors and to identify the contributing factors which affects their recurrence. The study also identified various healthcare professionals who committed the medication errors with a strong emphasis on the nursing staffs as they are mostly involved with the patients. A total of 1061 patient case files audited, 345 medication errors were reported, and out of which documentation errors were in the highest frequency. This is contradictory to the study conducted by Sheikh D *et al.*,[11] in which omission error was the most frequently observed medication error and Ana Belen Jimenez Munoz *et al.*,[12] in which transcription errors were dominant. Out of 345 medication errors, 49 errors (14%) reached to the patients (mostly administration errors), which is comparable to the study conducted by Elden NM *et al.*,[13] in which about 45% of the errors reached to the patient. The study showed that a majority of the errors were committed by the nursing personnel and therefore the experience of the involved staffs were analysed and categorised as less than 1 year, less than 5 years and more than 5 years. It was found that the staffs with less than 1 year experience were mostly involved due to heavy workload which was found to be similar to the study conducted by Gorgich EA *et al.*[14]

Various strategies were adopted to minimize the opportunity for medication errors. After observing such high rate of medication errors and identifying the nursing involvement in errors, training and education was done to reduce their occurrence. Certain parameters were considered on priority to reduce the episodes of errors related to nursing which includes choosing the correct patient, double checks (especially on the critical steps of the process), precise knowledge about the rate of administration of medications (prescribers were asked to include the rate of administration on the drug chart), reminder system for dose administration and standardized administration times (the nurses accepting the patient were informed on transfer of doses and scheduled doses). As a result of the impact of these strategies, the medication errors were reduced in the ICU whereas in wards, it still requires more accurate interventions which was comparable to the study conducted by Elden NM *et al.*,[13] in which after the interventions made, the overall medication error rates reduced from 6.7% to 3.6%.

CONCLUSION

All professionals who are involved in medicine management are governed by legal and professional accountability to follow best practice when prescribing and administering medication. It was the aim of the study to highlight areas of practice that could be improved, thus reducing the risk of error. The review has shown that there are many areas of medication management, which, if acted upon, will increase patient safety. This includes improving multi-professional record-keeping and deferring interruptions during medication administration. Taking a proactive multi-professional approach to reducing the risk of medication errors will positively impact on patient safety.

In the present study after adopting various interventions for minimizing the occurrence of medication error number got reduced in ICU to 2% from 9% whereas ward is still a challenge due to various reasons. Staff nurses should be highly competent in all aspects of the standards of care for medication management. Staff

nurses are vulnerable to having an error in medication management. Age, work-related experience, years of experience, and work setting affects the level of competency of the respondents on the standards of care on medication management. The more proficient a nurse is in the standards of care on medication management, the higher is the ability of a nurse to handle factors affecting medication errors, hence reducing the occurrence of medication errors in the clinical area.

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