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Medication Error Categorization and Kap Assessment in Paramedical Staff in Cardiology Department of a Tertiary Care Hospital- A Prospective Study

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ABSTRACT:
Medication errors are events that are posing a serious threat to the society currently. Medicine error can happen at any point of medication process including procurement, prescription, transcribing, administration, adherence, or monitoring therapy. The aim of the study is to evaluate and assess medication errors in cardiology department of tertiary care hospital and KAP assessment of paramedical staff.The prospective observational study was conducted in 208 cardiology patients in a tertiary care hospital and KAP assessment was done in 37 paramedical staffs.The prescribing errors (50%) was common followed by administration errors (46.38%),dilution errors (2.30%) and dispensing errors (1.31%). The majority of medication errors were classified as category C (An error occurred reached the patient but didn't cause patient harm) and category B(An error occurred but the error didn't reach the patient), according to NCCMERP classification.KAP assessment among healthcare professionals were carried out and nurses (48.64%) were less aware about medication error followed by trainee (24.32%) and pharmacist (27.02%). The study concluded that daily medication error monitoring to be done by clinical pharmacist and system to document / educate and report should be formulated.

KEY WORDS: Medication error, KAP, Healthcare professionals, cardiology department, NCCMERP, Patient safety.

I. INTRODUCTION:

The occurrence of medication errors is currently posing a severe hazard to society. It could result in improper medication use or patient damage[1]. Despite the fact that pharmaceutical errors can occur at any stage of the medicine process, including procurement, prescription, transcription, administration, adherence, or monitoring therapy, they occur more frequently during the prescribing and administering phases. [2-4] Medication mistakes can occur for a variety of reasons, including patient misinformation, staff shortages, inadequate training, and overcrowding at the pharmacy. Any one or a combination of factors can have an impact on how pharmaceuticals are prescribed, dispensed, used, and monitored, which may cause serious injury, disability, or even death.The United States of America reported that medication error cause at least one death every day and injures approximately 1.3 million people annually.[5]According to FDA (2022), receives more than 10,000 reports every year that are associated with medication errors.The Global Patient Safety challenge on medication safety aims to address the weakness in health system that leads to medication errors and severe harm that results.[6]Additionally, a British study on the prevalence and burden of pharmaceutical errors in 2018 projected that237million medication errors occurred across all phases of prescription administration.[7]Despite the fact that drug errors happen in all hospital departments, cardiac patients are more likely to experience them. Cardiovascular medications significantly contribute to medication mistakes (between 20 and 50 percent) in both outpatient and inpatient therapeutic settings.[8]Medication error can be associated with preventable contributing factors done by both healthcare providers and patients. So focusing on such factors and making awareness on these factors among various healthcare providers and patients can reduce problems in current scenario. This can be enabled through the assessment of knowledge, attitude, and perception (KAP) of the paramedical staffs regarding medication errors and by taking necessary steps to improve it. The purpose of the

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present study is to evaluate and categorizing the medication error and to analyse the knowledge, attitude, practice (KAP) of medication and its contributing factor among paramedical staff, with an attempt to inform development of intervention for reducing medication error among paramedical staff in the cardiology department of a tertiary care hospital.

II. METHODOLOGY

Study Site: The study is carried out in inpatient department of cardiology in tertiary care centre, Erode, Tamil Nadu.

Study Population: The study included the patients with carhdiovascular disease admitted the hospital (approximately 200). Paramedical staffs (approximately 40).

Study Design: Prospective observational study. Study Period: The study was performed for a period of six months March 2022 to August 2022.

A separate medication error reporting form was designed for proper reporting of such incidents which were occurred in the hospital, which is based on NCCMERP classification.

A separate KAP assessment form was designed to assess the knowledge, practice and attitude of medication error in paramedical staffs

A pretested structured questionnaire with 11 questions was prepared for this study in order to assess paramedical staff's knowledge, perception, and attitude about medication errors.

CATEGORIZATION OF ME:

Inclusion Criteria: Any patients admitted to the cardiology department during the study period. Patients with cardiac disorders of 18 to 85 years of age.

Exclusion criteria: Pregnant and lactating women. Patient with provisional diagnosis. Participants who unable to understand Tamil and English.

KAP ASSESSMENT IN PARAMEDICAL STAFF:

Inclusion criteria: Paramedical staffs: Nurses, pharmacists and trainee.

Exclusion criteria: Participants who unable to understand English and Tamil

III. RESULTS AND DISCUSSION

Table 1: Gender wise distribution of Medication Errors

Gender	Total Number of Prescription(n=208)	Number of prescriptions with Medication Errors	Percentage of Medication Errors (%)
Male	160	117	73.12%
Female	48	32	66.66%

A total of 208 cases of patients with cardiovascular disease were collected, out of which 160 (76.92%) were males and 48 (23.07%) were females. Medication errors were identified in 149 prescriptions among 208 cases of patients in which 304 medication errors were identified. Out of 149 prescriptions with medication errors, 117 were male patients and 32 were females, which indicates male patients were more vulnerable to medication errors, this could be attributed to an increase in the number of medications supplied to them. This increase in the amount of prescription drugs (Polypharmacy) could be related to connected co-morbid disorders caused by male patient's sedentary lifestyle**.**

Table 2: Number of Medication Errors in each Prescription

SI. No	Number of Medication Errors in each Prescription	Total Number of Medication Errors in each Prescription (%)
1	Prescription with one error	67(44.96%)
2	Prescription with two error	40(26.84%)
3	Prescription with three errors	25(16.77%)
4	Prescription with more than three errors	17(11.40%)

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The majority of prescriptions having more than one error, the prescription with one error 67 (44.96 %) were more common in the cardiology department, followed by prescriptions with two errors 40 (26.84 %), three errors 25 (16.77 %), and more than three errors 17 (11.40 %). It explains that each prescription contains at least one error, if it is extrapolated to higher population, it may leads to greater occurrence of medication error, so primary attention would be given to early detection, which can reduces the occurrence of error.

Table 3: Types of Medication Errors observed in Cardiac Patients

SI. No	Types of medication errors	Number of medication errors (%)
1	Dose missing	90(29.60%)
2	Frequency missing	21(6.90%)
3	Wrong dose error	23(7.23%)
4	Wrong drug error	5(1.64%)
5	Omission error	112(36.84%)
6	Inappropriate use of decimal	2(0.65%)
7	Inappropriate storage	4(1.31%)
8	Wrong time	123(40.46%)
9	Wrong dosage form	1(0.32%)
10	Untreated Indications	10(3.28%)
11	Wrong dose administration	18(5.92%)
12	Improper dilution	7(2.30%)

The table explained the types of error among cardiac patients. The most common type of error was found to be wrong time(123) followed by incomplete prescriptions (dose missing (90) and frequency missing(21)) and followed by untreated indication 10(3.28%), and inappropriate storage 7(2.30%), improper use of decimal 2(0.65%), incorrect dose 28 (9.21%), incorrect dosage form 1 (0.32%), omission errors112 (40.46 %). The results highlights the need of medication safety education among healthcare professionals especially nursing staffs as “wrong time” error was most common one that we have encountered during our study period.

Table 4: Contributing factors of Medication Errors

Factors lead to Medication Errors	Percentage
Physician related	10.85%
Improper Communication	2.30%
Nurse Related	73.68%
Inadequate Knowledge	48.35%
Inexperienced Professionals	44.07%
Illegible Prescription	17.10%
Distraction	14.80%
Heavy Workload	8.22%

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The table showed that the factors responsible for the occurrence of medication errors in cardiology. It was found that nurse related factors(73.68%) followed by physician related (10.85%) are the major contributing factors of medication errors. This may due to lack of knowledge, improper training, stressful environment, inexperienced professional.

Table 5: List of medication error occurred in cardiology department

Type of error	Percentage
Administration Error	46.38%
Dispensing Error	1.31%
Prescribing Error	50%
Dilution error	2.30%

The table explained that, the prescribing error (50%) was common followed by administration error, dilution error and dispensing error. The prescribing errors mainly accounts for dose missing, frequency missing, inappropriate use of decimal, wrong dosage form, untreated indications. As all of these medication errors were preventable, primary detection and evaluation can reduce the occurrence of such errors and further complications.

Table 6: Categorization of Medication Errors

SI. No	Level of severity		Number of Medication Errors (%)
1	No Error	Category A	3.61%
2	Error, No harm	Category B Category C Category D	42% 49.67% 0
3	Error, harm	Category E Category F Category G Category H	0 0 0 0
4	Error, Death	Category I	0

There were no reported deaths or lasting disabilities as a result of medication errors.The study revealed that approximately 151 (49.67 %) of errors reach the patient but did not cause potential harm. Approximately, half of the reported incidents 128 (42.10 %) of errors occurred but did not reach the patient. The majority of medication errors were classified as category C and category B, which may be due to a medication error prone environment in our study setting (distraction, heavy workload).

As we have evaluate all the detected medication error and we have found that most of the older male adult were mainly experienced in medication error and it was found that category C and category B errors were more common, so as this errors category B and category C coming under the class of preventable events. So in the process of prevention of medication error, the major intervention to be taken is awareness. So for implementing awareness we have analyze the awareness status among the healthcare professionals who were working in cardiology department.

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Table 7: Demographics and Professional characteristics of Paramedical staffs

Variable	Percentage(n=37)
Gender	
Male	9
Female	28
Professional status	
Nurses	18
Pharmacist	9
Trainee	10
Years of experience	
Less than 5 years	21
5-10 years	9
11-15 years	4
16-20 years	2
More than 20 years	1
Work environment (Patients /day)	23
<20	5
21-40	9
>40	

Table 8: Respondent's knowledge on medication error reporting

Knowledge	Nurses	Pharmacist	Trainee	Total
Knowledgeable	6 (33.33%)	2 (22.22%)	1 (10%)	9(24.32%)
Non-Knowledgeable	12 (66.66%)	7(77.77%)	9 (90%)	28(75.67%)
Total	18 (48.64%)	9(24.32%)	10(27.02%)	37(100%)

Table 9: Respondent's attitude on medication error reporting

Attitude	Nurses	Pharmacist	Trainee	Total
Favorable	10(55.55%)	3(33.33%)	3(30%)	16(43.24%)
Unfavorable	8(44.44%)	6(66.66%)	7(70%)	21(56.75%)
Total	18 (48.64%)	9(24.32%)	10(27.02%)	37(100%)

Table 10: Respondent's practice on medication error reporting

Practice	Nurses	Pharmacist	Trainee	Total
Practicing	6(33.33%)	3(33.33%)	2(20%)	11(29.72%)
Not Practicing	12(66.66%)	6(66.66%)	8(80%)	26(70.27%)
Total	18 (48.64%)	9(24.32%)	10(27.02%)	37(100%)

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KAP assessment among healthcare professionals were carried out and results showed that, an average of nurses (33.33) were less aware about medication error followed by trainee and pharmacist which may due to lack knowledge on medication error or hesitation in error reporting, fear of being blamed, lack of awareness program. As all the health care professionals were less aware on medication error, this may be the reason for occurrence of all the type of errors.

IV. CONCLUSION:

Our current study concluded that, more than half of the cardiac patients were experienced medication errors (304) at every different stage of medication processing.It was found that prescribing error were commonest among all which then followed by administering error, dilution and dispensing error. As per NCCMERP categorization, the majority of the errors were classified as Category B (events with the capacity to cause error) and Category C (error occurred, reached to the patient).On the other hand, the study also measured the awareness status on medication error among healthcare professionals who were involved in medication processing and it was found that very least were aware about medication error reporting, which may affect normal medication practices and quality of life of patients.So development of an efficient medication error reporting system is necessary to improve awareness and thereby a proper medication error reporting practice among health providers.Since prescribing errors and Category C errors are more common, a proper prescription auditing and patient monitoring by clinical pharmacist can also be employed to reduce incidence of such errors.Furthermore, it is an emergency to implement educational intervention programs for healthcare professionals. Additionally, in order to avoid errors, healthcare professionals should adhere to their responsibilities in a way that is far more effective and cautious.

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