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ASSESSMENT OF PRESCRIPTION ERRORS IN MEDICATION AT A TERTIARY CARE TEACHING HOSPITAL

Pharma

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ABSTRACT

Objective: Prescription mistakes and prescribing fault analysis were evaluated, prescription reasonableness was verified, and pharmaceutical errors were classified using the NCC MERP Index. **Methods:** Following Institutional Review Board permission, a two-month cross-sectional observational study was carried out at pharmacy stores following STROBE principles. Before patients received their prescriptions, their written informed consent was obtained, and all prescriptions obtained in this manner were photographed for documentation purposes. An analysis was conducted on 320 outpatient prescriptions from patients of all ages to determine how comprehensive the information was regarding the patient, the doctor, and the clinical diagnosis/indication. **Results:** Eight departments' worth of prescriptions in all were examined. In 100% of prescriptions, information regarding patients and prescribers was mentioned. In 195 prescriptions, the diagnosis (40%) and indication were noted. There were references to instructions for drug distribution (89%), patient instructions (90%), treatment duration (100%), follow-up visits (19%), and non-pharmacological instructions (13%). 82% of prescriptions were readable overall. Of the 978 medications prescribed, 92% had a generic name and 100% came from the essential drug list. For every medicine, the dosage and timing of administration were specified. **Conclusion:** We can use prescription records, clinical pharmacologists, computerized systems, and national conferences on logical prescription writing to lower pharmaceutical errors. Regular prescription audits and reporting are necessary to enhance the nation's healthcare system.

KEYWORDS

INTRODUCTION

A prescription is a written order from a physician to a pharmacist or nurse so they can handle a patient's medical needs. Any misinterpretation of this document could result in incorrect treatment, worsening of the illness, risks to one's health, and financial strain on the healthcare system for the sufferers. Medication errors are caused by these prescription mistakes and blunders.1. Medication errors are defined 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" by the US National Coordinating Council for Medication Error Reporting and Prevention (NCCMERP).2. Prescription errors are related to the process of issuing a prescription, whereas prescribing errors include improper, illogical, under-, and overprescribing, overprescription, and ineffective prescribing as a result of poor medical judgment or treatment or monitoring decisions.3. Any stage in the prescribing process, including the improper drug choice, dosage, mode of administration, and length of therapy, might result in error. Errors in the dispensing of medication may result from incomplete or inaccurate prescriptions that are difficult to read or write. Prescription errors mostly fall into two categories: errors of commission and errors of omission. Whereas errors of commission involve inaccurate information, errors of omission refer to prescriptions that are in some manner deficient.4

70% of drug errors are the result of prescription errors or prescribing errors.1. In a teaching hospital, the mean number of prescription errors that could have a negative impact on patients was four out of every thousand prescriptions.5. Prescription errors have been found to be frequent, affecting 4.2% to 82% of prescriptions, according to studies.6

Any stage in the prescribing process, including the erroneous drug choice, dosage, mode of administration, and length of therapy, might result in an error. Errors in the dispensing of medication may result from incomplete or inaccurate prescriptions that are difficult to read or write. A prescription audit can find these mistakes. "The review and evaluation of healthcare procedures and documentation to compare the quality of care which is provided, with the accepted standards" is the definition of a "audit."7. Prescription audits are a subset of audits that aim to track, assess, and, if required, recommend changes to medical professionals' prescription procedures.8

Prescription auditing is a crucial technique for preventing drug abuse and enhancing responsible drug usage. Prescription audits, when conducted on a regular basis, can help to improve the quality of prescriptions, allowing patients to receive the highest caliber of care and minimizing adverse drug events, hospital stays, morbidity, and death. This reduces the overall burden on the healthcare system and the community.9.

In order to create a collection of "core drug use indicators," the World Health Organization (WHO) and the International Network for Rational Use of Drugs (INRUD) worked together. The percentage of prescriptions written under generic names, the average number of prescriptions filled, the percentage of prescriptions containing antibiotics, the percentage of prescriptions containing injectable drugs, and the percentage of prescriptions written from the most recent National Essential Drug Lists (EDL) or formulary are the five main areas in which these prescribing indicators assess the practice of prescribers.10 These signs are helpful in evaluating prescription practices for medication use that is appropriate.

The objectives of the present study were to assess the prescription errors and prescribing fault analysis, document the information on the core prescribing indicators proposed by the WHO, check the rationality of the prescription, and categorize the medication error according to the NCC MERP Index.11

MATERIALS AND METHOD

1. Completeness of prescription in terms of the format as compared against the Standard prevailing in the country including
a. Details about the Doctor: Name, Qualification, Designation
b. Details about Patient: Full name, Age, Sex, Weight, Address, Contact No.
c. Clinical Diagnosis/Indication
d. Details about prescribing Standards: Name of the Drug, Dosage form, Dosing Information, Route of administration, Duration of treatment, Non-pharmacological advice, Follow-up advice
2. Legibility of prescription
3. Rationality of prescription based on Core Prescribing Indicators proposed by WHO:8

These indicators measure the performance of the doctors who appropriately use the drugs.
The core prescribing indicators are as follows:

I. Average number of drugs per prescription (encounter)
II. Percentage of drugs prescribed by generic name
III. Percentage of encounters with an antibiotic prescribed
IV. Percentage of encounters with an injection prescribedV. Percentage of drugs prescribed from essential drugs list or formulary

Health facility indicators

I. Availability of copy of EDL in all OPDs
II. Availability of key drugs

A cross-sectional, observational study was designed as per STROBE guidelines and was started after approval from the Institutional Review Board.

Conventional data collection from pharmacy store for 2 months Prescription analysis was done as per WHO core prescribing indicators, and descriptive statistical analysis was done by using Microsoft Excel.

Table 1 Prescriptions-related Information

	Component or Element	No. of Prescription	Percentage
1.	Patient information (name, age, sex, address, contact No.)	195	100%
2.	Weight of the patients	27	8%
3.	Diagnosis	126	40%
4.	Indication	195	100%
5.	Prescriptions with 5 or more drug	36	11%
7.	Instruction for dispensing Not Mentioned	36	11%
8.	Instruction for dispensing mentioned	126	40%
9.	Instruction for the patients mentioned	125	39%
10.	Instruction for patients not mentioned	31	10%
11.	Duration of treatment	195	100%
12.	Follow-up visit not mentioned	187	60%
13.	follow-up visit mentioned	91	41%
14.	Non-pharmacological instructions not mentioned	177	59%
15.	Non-pharmacological instructions mentioned	43	67%
16.	Complete	152	48%
17.	Incomplete	168	53%
18.	Legible	168	42%
19.	Illegible	59	18%

In this investigation, 195 prescriptions were examined; each prescription included patient demographic data as well as the name, title, and qualification of the prescriber. Every prescription contained the date and the location, and 27 of them also included the patient's weight. A prescription with a diagnosis was written in 126 (40%) of the prescriptions, while 195 prescriptions had a drug consumption indication. 36 (11%) of the prescriptions had five or more medications written on them. Every prescription included a statement of the treatment's length. 43 (13%) prescriptions specified non-pharmacological advice, while 61 (19%) prescriptions mentioned a follow-up visit. Table 1 and Figure 1 show that out of 320 prescriptions, 152 (48%) were complete and 261 (82%) were readable.

195 prescriptions were written for a total of 1004 medications. Prescriptions were written for three medications on average. Of the 987 medications prescribed, 921 (92%) had a generic name, and 27 (3%) had a fixed dose combination. There were several drug formulations used, including pills, capsules, lotions, and injections. 148 prescriptions out of 987 did not specify the dosages of the medications. All medications were from the EDL, and the majority (99%) could be found in hospital formularies. The dosage and frequency of each medication were specified. (Table 2 and Figure 2).

Every area, including dermatology, psychiatry, orthopedics, ENT, dentistry, and surgery, as well as obstetrics and gynecology (OBGY). Every department's prescription contained a reference to patient information. Only 3% of patients in the psychiatric department and 65% of patients in the OBGY department had their weight stated in their prescriptions. Every prescription contained a reference to the prescriber's information. In all, prescriptions for medicine (30%), orthopedics (28%), skin (8%), and surgery (25%), all included five or more medicines. In the dermatology department, the diagnosis was included in 98% of prescriptions; however, the diagnosis was not included in any prescriptions in the dental department. Overall, the skin, ENT, and dentistry departments stated 100% of the drug's indications, however the orthopedic department mentioned 0% of prescriptions for the medication.were mentioned. were brought up. Prescriptions for OBGY (10%), orthopedic (18%), skin (25%), ENT (13%), and surgery (25%), did not include instructions for dispensing. Prescriptions for OBGY, orthopedics (10%), skin (28%), ENT (5%), and surgery (25%), did not include instructions for patients. Prescriptions for medicine (90%), OBGY (68%), orthopedics (100%), psychiatry (75%), skin (100%), ENT (100%), dentistry (33%), and surgery (83%), did not include a mention of follow-up visits. Only in the prescriptions for medicine (43%), psychiatry (8%), and surgery (58%), was non-pharmacological guidance mentioned. Overall, 78% of the surgical department's prescriptions were complete, followed by 73% of the skin department's, while 100% of the orthopedic department's prescriptions were incomplete. 100% of prescriptions in the departments of OBGY, orthopedics, psychiatry, dentistry, and surgery were readable, and 100% of prescriptions were not readable.

In the OBGY and orthopedic departments, 100% of prescriptions were written using the generic name, whereas just 18% of prescriptions in the medical field were written using the brand name alone. In 99% of OBGY departments and 93% of psychiatric departments, the tablet formulation is prescribed. Additionally, 54% of antibiotic prescriptions were written in the dental department and 99% of vitamin prescriptions were written in the OBGY. Prescription medications from every department were accessible at EDL. The dosage formulation, frequency of administration, route of drug administration, and length of treatment were all 100% accurate.

DISCUSSION

The most crucial role of the healthcare system is its capacity to provide the appropriate medications to the appropriate patients. Written prescriptions are a crucial tool for doctors, and it is both morally and legally required of them to create clear, concise prescriptions.12 Quality of life can be raised by raising the bar for medical care, and prescription audit plays a key role in this because it provides documented proof for hospital facility use, diagnosis, and treatment.13 In order to evaluate prescribing errors and faults, examine and record data on the WHO's core prescribing indicators, and verify that the prescriptions were reasonable, this study was carried out in a tertiary care hospital.

Eight departments' worth of prescriptions—195 in all—were examined for this investigation. The fundamental components of a prescription, such as the name, title, and qualification of the prescriber and the patient's name, age, sex, weight, address, and phone number, were analyzed. We also examined the prescription's date of issue, diagnosis, readability, instructions for patient education, instructions for medicine dispensing, inclusion of critical non-pharmacological measures, and follow-up visit. Drug-related information includes the following: percentage of drugs prescribed by generic name, percentage of injectables, percentage of antimicrobials, percentage of drugs from the essential drug list, formulation of the medication, fixed drug combination, route, frequency, and duration of treatment, and WHO indicators for rationality.

Every prescription includes the patient's demographic information as well as the prescriber's name, title, and certification. These outcomes outperformed those of the Ansari et al. trial, which found that 85.4% of prescriptions lacked the prescriber's information.4 All prescriptions had the date and location printed on them using computer software. The date is crucial in order to define the course of the treatment plan, prevent future medication abuse, and prevent needless fillings. 27 prescriptions totaling the patients' weight were written down; 26 of those came from the OBGY department. For pediatric patients, weight is crucial in determining the medicine dosage.

260 (81%) of the prescriptions in the current study were written by residents, with tutors following in the In the dentistry department, there are 34 (11%) tutors and 11 (3%), consultants. Of the prescriptions written, 126 (40%) mentioned the diagnosis, and 195 (61%) mentioned the drug's indication for use. Compared to the research carried out by Debjit Chakraborty et al. and E. Yousif et al., 33.3% and 94%, respectively, of prescriptions lacked a diagnosis14,15.

Prescriptions were written for three medications on average. Eleven percent of prescriptions had more than five medications in total. Medication mistakes and hospitalization are increased risks associated with polypharmacy.16 Additionally, it raises morbidity and death

rates, lowers patient adherence, and adds to the healthcare system's financial burden.17 Eighty-nine percent of prescriptions included instructions for drug delivery, and every prescription included information about the length of therapy. In a study by Singh et al., instructions to the patient were mentioned in 33.3% and follow-up advice was mentioned in 24.2% of prescriptions; non-pharmacological instructions were not mentioned in 87% of prescriptions. In contrast, instructions for patients were mentioned in 90% of prescriptions and a follow-up visit was mentioned in 19% of prescriptions.18 In our analysis, 82% of prescriptions for orthopaedics, psychiatry, dentistry, and surgery were readable; 100% of prescriptions, with the exception of the ENT department, were readable; and 0% of prescriptions were readable. Prescriptions were legible in only 13% of cases. In contrast to Patel P. et al.'s study, 75% of prescriptions were readable.1. Ninety-two percent of prescriptions in a research by Natarajan et al. were readable.19 64.3% of prescriptions in a study by Y.M. Irshaid et al. were not readable.20 Einstein's research revealed that 6.6% of prescriptions were not readable.21 Prescriptions that are difficult to read might cause confusion, which can lead to mistakes being made by pharmacists or nurses when administering or dispensing medication. Therefore, it's critical to write prescriptions legibly to avoid these kinds of drug mistakes.

Of the 1005 medications in the current investigation, 92% had generic names inscribed on them. Just 4.16% of medications were administered by generic name in a study by Balbir K. et al., whereas 2.81% of medications were prescribed by generic name in a study by Patel P. et al. In this survey, the brand name was inscribed on 8% of medications.1,22 Brand-name medications may cost more than generic equivalents when prescribed. Misunderstandings arise among pharmacists due to lack of information or non-availability of certain medications.

Less drugs—27—were administered as a fixed dose combination in our study than in those carried out by Balbir et al. (97.91%) and Chakrabarti et al. (59%).22, 23 Fixed-dose combos provide benefits, including as being more cost-effective than oral therapy in situations where oral drug may be more suitable. In addition, non-sterile injections might spread blood-borne illnesses like hepatitis and HIV/AIDS infections. Of the 1005 medications, 148 did not specify the dosage.

Out of 987 medicines, 13% medicines were antimicrobials. In a study done by Rai S., 55.4% of prescriptions contain antimicrobials.24 In a study conducted by Kaur B., 11.84% of antibiotics were prescribed.22 Appropriate use of antibiotics after culture sensitivity testing is necessary to prevent the emergence of drug resistance. Most of the acute respiratory and acute gastroenteritis cases are viral in nature and may not need antibiotics. An antibiotic policy should be formulated so that clinicians can use them judiciously according to patients' needs. In our study, 99% of drugs were available in hospitals and all drugs were from the EDL 2022, and when compared to a study conducted by Balbir K. et al., 53.25% of drugs were from EDL.22

In a similar study on topical corticosteroids, Sharma et al. reported that the frequency of application was recorded in 93% of prescriptions.12 In a study conducted by Dhamodharan et al. which is similar to this study, at an outpatient tertiary care teaching hospital, dose and dosage schedule were mentioned in 98% of prescriptions, and route of drug administration was present in 98.8% of prescriptions.25 In the present study, dosage schedule, route of administration, and frequency were mentioned in 100% of prescriptions. This may reduce underdosing or overdosing, subsequent treatment failure, and drug-drug interactions.25 In Joshi et al.'s study, 61.34% of prescriptions were complete, while in the present study, 48% of prescriptions were complete.26

Prescriptions of surgery and orthopedic department have an error of omission like the weight of the patient was not mentioned in a single prescription, and instructions to the patient were not mentioned (43% of prescriptions) in contrast to our study by Subramaniam et al. where prescription error in surgery ward 97.75% and orthopedic ward 97.53%.27 Errors of omission like diagnosis not mentioned in the prescription present in 60.63% of total prescriptions.28

Prescription errors were classified as type C in a study by Subramaniam et al., and 35 errors (87.5%) in a study by Sheik et al. Contrary to these research, the NCCMERP classifies the prescription errors made by the departments of medicine, OBGY, psychiatry, skin, orthopedics, ENT, dentistry, and surgery as category B errors ofomission.27,29

Concerns include polypharmacy, restricted generic prescribing, the prescription of illogical FDCs, and medications that are not included in EDLs. It was necessary to evaluate these prescribing errors based on routine monitoring with WHO core drug use indicators, which may lower medication errors. Across the nation, carefully thought-out action plans are urging doctors to prescribe logical FDCs, utilize capital letters for generic names, and follow Automated computerized prescription systems are a useful tool for reducing medication errors; nevertheless, they are costly, non-university accessible, and require training. It is possible to employ standardized medication charts that include prescriptions and all pertinent clinical data. This method has shown to be a reliable and somewhat easy substitute for electronic systems. Pharmacists and non-prescribing employees can both benefit from training that helps lower pharmaceutical errors other than prescription errors.3. Reviewing prescribing errors guarantees that staff members and prescribers use a variety of information sources to test for drug-drug interactions. Interaction notifications may be offered by community pharmacy patient medication record systems and electronic prescribing systems.30

Health facilities should have a simple reporting procedure that supports and encourages personnel to report. A certain medical facility has a program called "Good Catch" in which doctors receive recognition and a gift.31 Solanki ND et al. demonstrated that the application of statistical process control (SPC) boosted prescription audit rate compliance and decreased non-compliance with the prescription audit rate.8 Medication errors may be decreased by routinely reporting prescription errors and by holding training and education sessions. If prescriptions are evaluated by clinical pharmacologists, prescription errors can be prevented and decreased. Clinical pharmacologists are highly knowledgeable in medicinal qualities, safety, drug-drug interactions, and treatments.

CONCLUSION

The computerized method was employed in this study to capture all of the demographic data about the patients and physicians. 100% of the prescriptions included information about the drug's dosage, route, and frequency. A number of the prescriptions were missing non-pharmacological information, patient instructions, or instructions on how to administer the medication. According to the NCC MERP categorization, medication errors in our study were classified as type B. Prescription records, automated systems, clinical pharmacists, and national conferences on logical prescription writing can all help reduce medication errors. Sufficient prescription audits and reporting are essential for improving the country's healthcare infrastructure.

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