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RESEARCH ARTICLE

Audit of outpatient prescription at a tertiary care hospital in South India: An observational study

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ABSTRACT

Background: Prescriptions are medico-legal documents and it is the duty of every physician to write a complete, legible, and valid prescription to ensure rational drug use and prevent the occurrence of medication errors. Periodic prescription audit is required for identification of common deficiencies in the prescriptions, to undertake corrective measures for improving the prescribing practices. **Aim and Objective:** The objective of the study was to assess the completeness of the outpatient hand-written prescriptions presented to the pharmacy of a multi-specialty tertiary care teaching hospital in South India. **Materials and Methods:** This was a prospective, descriptive cross-sectional study in which data from the outpatient prescriptions presented to the pharmacy for drug dispensing were recorded. The prescriptions were analyzed for completeness by assessing the presence or absence of the following essential components: (a) Date; (b) patient information (hospital registration number, name, age, gender, and address); (c) prescriber information (Name, Registration number, Signature); and (d) medication details (use of generic names, appropriateness of drugs, prescribing from national list of essential medicines [NLEM] 2015, capitalized drug names, dose, dosing schedule, route of administration, and instructions). **Results:** Of the total 600 prescriptions analyzed, all of them had date and complete patient details. Doctor's name, registration number, and signature were mentioned in 70.8%, 38%, and 98.3% of prescriptions, respectively. About 30.3% and 26.8% of prescriptions had generic names and capitalized drug names, respectively. Only 2% of prescriptions were not legible. All the drugs prescribed were appropriate and from NLEM 2015. Dose and dosage schedule were clearly mentioned, each in 98% of prescriptions. Route of drug administration and instructions was present in 98.8% and 10% of prescriptions, respectively. **Conclusion:** This study showed that all the essential elements except doctors' registration number, generic prescribing, drug names in capitals, and instructions to patient were present in majority of the prescriptions.

KEY WORDS: Completeness of Prescriptions; Prescription Analysis; Prescription Errors; Rational Drug Prescription

INTRODUCTION

A prescription is a written communication from a qualified registered medical practitioner to a pharmacist for a treatment to be provided to their patient. Prescriptions are medico-legal documents and it is the duty of every physician to write a complete, legible, and valid prescription to ensure rational drug use and prevent the occurrence of medication errors. According to the World Health Organization (WHO), "Rational use of medicines requires that patients receive medications appropriate to their clinical needs, in doses that meet their own individual requirements, for an adequate period of time, and at lowest cost to them and their community.[1]" The WHO has also published a document on guide to good prescribing, in which it has enumerated the essential elements of a prescription and explained the

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importance of each element.[2] A good quality prescription should include at least the following essential elements: Date of prescription; patient details such as hospital registration number, name, age, gender and address; prescriber details such as name, registration number, and signature; and medication details such as drug name in generic and capitals, its dose, route, frequency, duration of administration, and instructions to patient.[2]

Various prescription audit studies done at the national and global level reveal various deficiencies in drug prescribing practices.[3-8] Many prescriptions are illegible and incomplete; they are missing out on certain essential elements, thus increasing the likelihood of occurrence of medication errors, and leading to drug toxicities; some of which could be life threatening for the patients. Other problems with irrational prescribing could be development of antibiotic resistance, failure of treatment, increased treatment cost, development of drug dependence, wastage of scarce health resources, and lack of patient confidence on the health-care system.[9] Thus, it is essential to devise strategies to improve the quality of drug prescriptions. This can be achieved by regular prescription auditing practices and provision of constructive feedback to the prescribers on the common deficiencies in the prescriptions.

Hence, the present study was formulated to assess the completeness of the outpatient hand-written prescriptions presented to the pharmacy of a multi-specialty tertiary care teaching hospital in South India.

MATERIALS AND METHODS

A prospective, descriptive cross-sectional study was undertaken in the pharmacy of Sri Manakula Vinayagar Medical College and Hospital, Puducherry. The study was initiated after obtaining approval from the Institutional Human Ethics Committee and it was conducted according to Good Clinical Practice guidelines. The study was conducted for a period of 4 months from August 2019 to November 2019. Data from the outpatient prescriptions presented to the pharmacy for drug dispensing were recorded. The prescriptions presented to pharmacy between 10 am and 12.30 pm, irrespective of age, and gender and the prescribing department was included in the study. Prescriptions presented by admitted patients, and those from intensive care units (ICUs) were excluded from the study. Confidentiality of participants' data was maintained throughout the study. Based on the recommendations of the WHO document on "How to investigate drug use in health facilities?", at least 600 prescriptions were required to be analyzed in this study.[10] The prescriptions were selected by systematic random sampling.

The prescriptions were analyzed for completeness by assessing the presence or absence of the following essential components using a checklist. The parameters are: (a) Date of issuing the prescription; (b) patient information (hospital registration number, name, age, gender, and address); (c) prescriber information (name, registration number, and Signature); and (d) medication details (generic/brand names, drugs were appropriately indicated for the patients' clinical diagnosis, prescribed from Indian national list of essential medicines [NLEM] 2015,[11] writing drug names in capital letters, dose, dosing schedule [frequency and duration of drug administration], route of administration and instructions to patient).

Statistical Analysis

The data collected were entered into the Microsoft Excel (Microsoft Office 2007) and analyzed using Statistical Package for the Social Sciences software version 24. Categorical variables were expressed as frequencies and percentages.

RESULTS

A total of 600 prescriptions were analyzed in this study.

Patient Information

All the 600 prescriptions were complete with regard to date of issuing the prescription and the presence of patient information such as hospital registration number, name, age, gender, and address.

Prescriber Information

Hospital name and address were printed in all prescriptions. Prescribing doctor's name and their registration number were mentioned only in 425 (70.8%) and 228 (38%) prescriptions, respectively. Doctor's signature was present in 590 (98.3%) prescription [Figure 1].

Medication Details

Generic drug names were used only in 182 (30.3%) prescriptions. All the drugs prescribed were appropriately

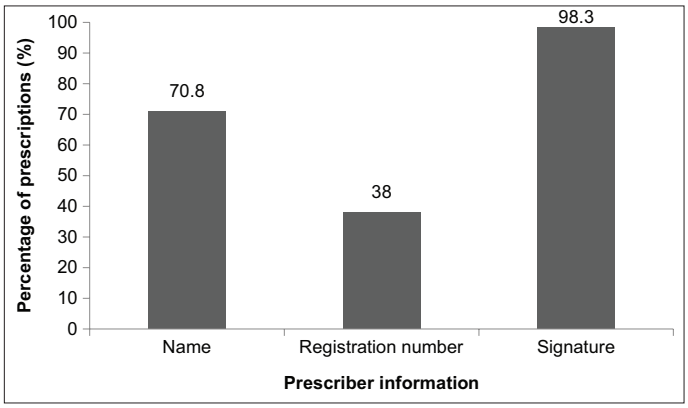

Figure 1: Completeness of the prescriptions with respect to prescriber information (n = 600)

indicated for the patients' clinical diagnosis and all of them were prescribed from Indian NLEM 2015. A mere 161 (26.8%) prescriptions had drug names written in capital letters. However, majority of the prescriptions were legible and only 12 (2%) prescriptions were not legible. Dose and dosage schedule (including frequency and duration) were clearly mentioned, each in 588 (98%) prescriptions. Route of drug administration was clearly present in 593 (98.8%) prescriptions. Unfortunately, only 60 (10%) prescriptions had instructions for the patient [Figure 2]

DISCUSSION

The present study was undertaken to evaluate the completeness of handwritten prescriptions presented to the Pharmacy by the outpatients for drug dispensing. Data were collected from a total of 600 prescriptions. It was found that all the essential elements except doctors' registration number, generic prescribing, drug names in capitals, and instructions to patient were present in majority of the prescriptions.

In our study, it was encouraging to find that all the prescriptions were complete with regard to the presence of patient information such as hospital registration number, name, age, gender, and address. Our study findings are comparable to the results of similar studies done by Ahsan *et al*.,[3] Siddharth *et al*.,[4] and Abidi *et al*.,[5] in which all, 99.3% and 72.57% of the prescriptions were complete with respect to the patient details. Moreover, another study by Bhosale *et al*.[6] on analysis of completeness of prescriptions, revealed that although the patient's name, age, and gender were present on 94.75%, 77.25%, and 69.5% of the prescriptions, respectively, none of them had a mention on patients address. The importance of mentioning complete patient information in a prescription can never be undermined. Patients' name, hospital number, age, gender, and address helps in ensuring that correct medications are given to the right patient. Age is also an important element especially for prescriptions of pediatric and geriatric patients. The presence of age in a prescription helps the pharmacist in cross-verification of drug dosages and gives them an opportunity to prevent the occurrence of medication errors. The presence of patient identifiers also aid in record maintenance.[12] The presence of patient identifiers in a prescription can be ensured by the use of small detachable stickers containing these information, which can be stuck on the prescriptions, thus helping to save time in writing these details by the physicians.

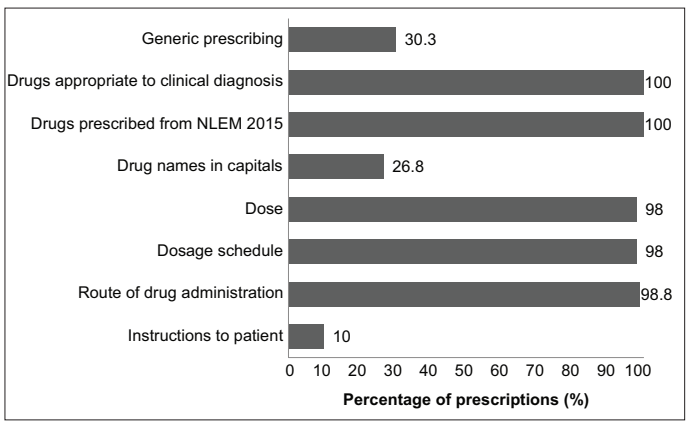

Figure 2: Completeness of the prescriptions with regard to medication details (n = 600). NLEM: National list of essential medicines

In our study, date of issuing the prescription was found in all prescriptions, which was similar to the findings of Ahsan *et al*.,[3] Dharmadikari *et al*.,[13] and Sudarsan *et al*.[14] Date of the prescription is also very important element, since it helps to ascertain when the prescription was written. It also helps in record maintenance, assessment of patient compliance and also alerts the pharmacist to curb the practice of unnecessary prescription refilling by the patients.[12]

Furthermore, prescriber details are also highly essential elements of a valid prescription. In the present study, hospital name and address were printed in all prescriptions. However, doctors' name, registration number, and signature were present in 70.8%, a mere 38%, and 98% of the prescriptions, respectively. Similarly, the study conducted by Ahsan *et al*.[3] showed that doctors' name was present in all prescriptions, but registration number was not present in any of the prescriptions. Furthermore, doctors' initials were not present in 17% of the prescriptions. In contrast, the study by Singh *et al*.[15] showed that signature of the prescribing doctor was present in 65.8% of prescriptions. Prescribers missing out on their information in the prescription could be attributed to the high patient load and lack of awareness among the physicians regarding its importance in a prescription. Physicians should be sensitized that prescriptions are medico-legal document and that they are mandated, as per the Indian Medical Council (Professional Conduct, Etiquette and Ethics) regulations 2002, to write their full name, complete designation, and registration number in the prescription letter head.[16] Furthermore, in government hospitals where there is tremendous patient load, doctors can write their name below their signature. Furthermore, this practice will be helpful in identifying the prescriber in case of any discrepancies in the prescribed medication so as to clarify any doubts before the medications are being dispensed.[2]

On analysis of the prescriptions, we found that generic drug names were used only in 30.3% of prescriptions, which is almost similar to the findings of a prescription audit study done by Kumari *et al*.[17] In their study, the generic prescribing was seen in 27.1% of the prescriptions. Moreover, a study by Rai *et al*.[18] showed that only 11.3% of the drugs were prescribed in generic names. A further gloomy finding (only 1.63% of prescribed drugs were in generic) was seen in a study of prescribing practices in outpatient department of an apex tertiary care institute by Siddharth *et al*.[4] The low prevalence of prescribing by generic names among doctors

could be because of their lack of knowledge about its benefits, lack of confidence on quality of generic drugs, and promotion of branded drugs by pharmaceutical companies.[19]

In the current study, although only 26.8% of the prescriptions had drug names written in capital letters, majority of them were legible and only 2% of the prescriptions were not legible. A similar finding in terms use of capitals for drug names was observed in Keshri *et al*.[7] study, where only 14.57% of prescriptions had all drug names in capitals. Furthermore, in the study by Ahsan *et al*.,[3] none of the prescriptions had drug names in capitals and 8.16% of prescriptions were illegible. This was in contrast to a study by Kaushik *et al*.,[20] in which the compliance for drugs in capitals was found to be very high. It was observed that prescriptions of patients admitted in wards and ICUs were written in capitals in 98% and 100% of the prescriptions, respectively, and none of the prescriptions were totally illegible. Writing illegible prescriptions are highly unethical and this practice should be curbed. In addition, writing drugs in capitals enhances the legibility of the prescription, prevents the occurrence of medication errors during drug dispensing, and promotes rational drug use.

In 2016, the Medical Council of India made an amendment mandating generic and legible prescribing in the Indian Medical Council (Professional Conduct, Etiquette, and Ethics) Regulations, 2002. It states that "Every physician should prescribe drugs with generic names legibly and preferably in capital letters and he/she shall ensure that there is a rational prescription and use of drugs.[16]"

In the present study, all the drugs prescribed were appropriately indicated for the patients' clinical diagnosis and all of them were prescribed from Indian NLEM 2015.[11] The findings are comparable to Naveen *et al*.[21] study, in which 97.07% of the drugs were prescribed from NLEM. Essential medicines are those that satisfy the priority healthcare needs of the population. They are the most efficacious, safe, and cost-effective medications. Prescribing from NLEM is a welcome step since it promotes rational use of drugs and helps to sustain the long-term medicines supply.[9]

In our study, dose and dosage schedule (including frequency and duration) were clearly mentioned, each in 98% of prescriptions. Route of drug administration was clearly present in 98.8% of prescriptions. It was surprising to find that only 10% of the prescriptions had instructions for the patient. These findings were in congruence to the results of similar prescription audit studies.[4,8,15] The percentage of prescriptions clearly mentioning dose and dosage schedule was 6.2%–97.2% and 72.5%–100%, respectively.[4,8,15] Similarly, route of drug administration was missing in 3%–6% of the prescriptions.[4,8] The percentage of prescriptions mentioning instructions for patient varied from 6% to 43.3%.[4,8,15] Mentioning of drug dosage, its frequency and duration of administration are of paramount importance, since it determines the safety and efficacy of the drug regimen. Under-dosing or overdosing can also lead to treatment failure, antibiotic resistance, or adverse drug reactions. Furthermore, route of drug administration must be explicitly mentioned in the prescription to avoid ambiguity, which can pave way for occurrence of medication errors. More so, any error in the route of drug administration can have devastating consequences for the patients. In addition, it is also essential to write instructions to the patients in the prescriptions. The instructions could be related to the timing of drug administration (e.g., before/after food), lifestyle modifications including dietary changes (e.g., avoid spicy foods), warning signs of disease exacerbation (e.g., blurring of vision in preeclampsia), adverse effects of drugs (e.g., rifampicin causing orange discoloration of urine), storage instructions (e.g., regular insulin must be stored in a refrigerator), and management of left over drugs (e.g., freshly prepared oral rehydration solution should be discarded after 24 h) and frequency of follow-up visits.[2]

It is the ethical and legal responsibility of a physician to write complete and legible prescription. Various strategies can be employed to improve the quality of the prescriptions. One such is the use of electronic prescriptions, which ensures that prescriptions are complete and legible. A study by Albarrak *et al*.[22] on comparison of handwritten and electronic prescriptions for completeness and legibility found that the later was complete, less prone to illegibility issues and had less prescribing errors. This could be ascribed to the fact that electronic prescriptions are generated from databases containing patient, drug, and clinical information within the computer system; thus, reducing the risk of prescribing errors. Another strategy could be periodic training of the prescribers on rational drug prescribing practices and stressing the importance of a complete and legible prescription in prevention of medication errors. Furthermore, frequent prescription audits with provision of feedback to the prescribers on the commonly encountered prescription errors would aid in improving the quality of prescriptions. In addition, formulation of institutional policies on good prescribing practices would be of great benefit in promoting rational prescribing.

The limitation of the study is that it was conducted in a single hospital and hence caution should be excised in generalizing the study findings.

CONCLUSION

This study showed that all the essential elements except doctors' registration number, generic prescribing, drug names in capitals, and instructions to patient were present in majority of the prescriptions. Regular prescription audit followed by constructive feedback to the prescribers will further improve the quality of prescriptions. Furthermore, frequent conduct of training sessions and workshop on rational drug

prescribing for the physicians will help in minimizing the deficiencies in the prescriptions. Moreover, the importance of the various missed elements in the prescription should be further emphasized during the constructive feedback session and physician training sessions.

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