

Prescription audit of a teaching hospital in South India using World Health Organization core prescribing indicators – A cross-sectional study

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Abstract

Aim: World Health Organization (WHO) core prescribing indicators are highly standardized tools in reliably assessing the essential aspects of drug utilization pattern. It is critical that the rational use of drug prescribing is scrutinized for the utmost benefit of patient welfare. In this study, we aim to assess the prescription pattern and prescribing behavior of physicians using the WHO-recommended core prescribing indicators at a teaching hospital in South India.

Materials and Methods: A prospective, descriptive cross-sectional study was conducted in the general medicine outpatient department of a tertiary care hospital for a period of 1 month in June 2019. A total of 600 prescriptions were sampled based on the WHO “How to investigate drug use in health facilities” document recommendation. The WHO guidelines and methods were observed to ensure data reliability. Descriptive statistical analyses such as frequencies, percentages, mean, and standard deviation were used to present the data.

Results: The WHO core prescribing indicators analysis revealed that the average number of drugs per encounter was 2.38 ± 1.1 and only 796 (55.4%) of the drugs were prescribed by generic name. Whereas, the percentage of encounters prescribed with an antibiotic 44 (7.3%) and an injection 63 (10.5%) was less than the ideal recommendations as per WHO and 1265 (88%) of the drugs were prescribed from the National List of Essential Medicines.

Conclusion: This study on prescription pattern audit done using the WHO core prescribing indicators highlights that prescriptions encountered with antibiotic and injection use were in accordance with the WHO recommendations.

Keywords: Fixed-dose combination, generic drugs, prescribing indicators, prescribing pattern, prescription audit, rational prescribing

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Received: 07-06-20, **Revised:** 25-09-20, **Accepted:** 03-10-20, **Published:** 08-01-21

INTRODUCTION

Prescribing pattern behavior reflects the health promoter’s responsibilities toward the rational use of drugs. Audit

of such prescribing practice aids in improving the drug use pattern by identifying the nuances and critical steps

Access this article online	
Quick Response Code:	Website: www.picronline.org
	DOI: 10.4103/picr.PICR_172_20

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How to cite this article: Meenakshi R, Selvaraj N, Anandabaskar N, Dhamodharan A, Badrinath AK, Rajamohammad MA. Prescription audit of a teaching hospital in South India using World Health Organization core prescribing indicators – A cross-sectional study. *Perspect Clin Res* 2022;13:132-6.

involved which could be evolved for a better health care to the patient. The most common causes of inappropriate use of medicines are polypharmacy, inappropriate use of antibiotics, overuse of injections, failure to prescribe in accordance with clinical guidelines, and inappropriate self-medication.^[1]

As India embarks on health financing transition, increasing the government spending on health expenditure, as the public spending on health priority has increased.^[2] It is critical that the rational use of drug prescribing is scrutinized for the utmost benefit of patient welfare.

World Health Organization (WHO) core prescribing indicators are highly standardized tools in reliably assessing the essential aspects of drug utilization.^[3] Drug usage pattern is an essential indicator of careful selection of a drug in accordance with the therapeutic diagnosis, and drug utilization research aids in surveying and understanding the diverse processes involved in health care.^[4] India is the third-largest manufacturer of generic drugs in the world.^[5] Generic drugs are about 80%–85% less expensive than brand-name drugs, as per the Food and Drug Administration. Prescribing generic drugs offer to reduce the patients' out-of-pocket health-care expenditure toward medicines.^[6] Further choice of medicine, based on adequate data on safety, efficacy, and cost-effectiveness, from the National List Of Essential Medicines (NLEM) improves the patient compliance.^[7] Most of the studies indicate the prescribing pattern of primary and secondary level government hospitals, and there is a gap in the data of drug usage pattern among private tertiary level teaching hospitals in India. In this study, we aim to assess the prescription pattern and prescribing behavior of physicians at a teaching hospital in South India using the WHO-recommended core prescribing indicators.

MATERIALS AND METHODS

A prospective, descriptive cross-sectional study was conducted in the general medicine outpatient department (OPD) of a tertiary care hospital after obtaining prior Institutional Ethics Committee approval. The study was done for a period of 1 month in June 2019. Data from the prescriptions of outpatients attending the department of general medicine OPD were recorded. A total of 600 prescriptions were sampled based on the WHO "How to investigate drug use in health facilities" document which recommends at least 600 prescription encounters to assess drug use pattern in health facilities.^[8] Around 20 prescriptions per day which were selected by stratified random sampling covering both male and

female OPDs, irrespective of age and diagnosis from the outpatients attending the general medicine department during the OPD hours, were included in the study. Prescriptions which did not contain any drugs were excluded from the study. The prescribing encounters sampled were selected in a systematic way and included only the prescriptions from the general medicine OPD to rule out the varied treatment practices from other departments. This was to ensure targeted follow-up investigation of the specific treatment practice to be done in case of a drug use indicator issue.^[3]

The WHO guidelines and methods were observed to ensure data reliability.^[3] Data from the prescriptions were recorded in the data collection forms, excluding patient name, hospital registration number, and address based on the following parameters.

The names and number of the drugs prescribed were noted down along with dosage forms, route of administration, dosage, frequency, and duration of treatment to assess the (WHO) core prescribing indicators, namely:^[3]

- Average number of drugs prescribed per encounter: Average calculated by dividing the total number of drugs prescribed by the total number of encounters sampled
- Percentage of drugs prescribed by generic name = (Number of drugs prescribed by generic name/total number of drugs prescribed) × 100
- Percentage of encounters with an antibiotic prescribed = (Number of patient encounters with an antibiotic/total number of encounters sampled) × 100
- Percentage of encounters with an injection prescribed = (Number of patient encounters with an injection prescribed/total number of encounters sampled) × 100
- Percentage of drugs prescribed from NLEM = (Number of drugs prescribed from essential drug list/total number of prescribed drugs) × 100.

The audit of the prescription also included the completeness and legibility of the prescriptions along with core prescribing indicators to cover all the aspects involved in the overall appropriateness of prescribing performance of the physicians. Completeness of prescription was evaluated based on the presence or absence of patient identifiers (name, age, sex, and address), prescriber identifiers (physician name, signature, and registration number), instructions (follow-up advice), and diagnosis. Analysis of the dosage regimen was done based on writing drug names in capital letters and presence or absence of drug dosage, route of administration, frequency, and duration of treatment.

Legibility of the prescription was recorded by a subjective grading scale based on two independent investigators as:

- Grade 1 (poor): Illegible
- Grade 2 (average): Most words are illegible
- Grade 3 (good): Some words are illegible but understood by a physician
- Grade 4 (excellent): Legible.

Data collected were entered in Microsoft Excel, and analysis was performed using the Statistical Package for the Social Sciences (SPSS Statistics for Windows, version 24. Armonk, NY, USA: IBM Corp). Descriptive statistical analyses such as frequencies, percentages, mean, and standard deviation were used to present the data.

RESULTS

A total of 600 prescriptions were assessed. About 284 (47.3%) of the prescription encounters were from male OPD and (316) 52.7% from female OPD. The mean age was 44.03, with a range of 13 and 84 years. All the prescriptions had the patient identifiers such as name, age, sex and address mentioned. About 496 (82.7%) of the prescriptions had diagnosis mentioned and 589 (98.2%) of them with details of follow-up instructions. Prescriber identification (physician signature and registration number) was mentioned only in 478 (79.7%) of the prescriptions [Table 1].

On analyzing the dosage regimen component, a total of 1437 drugs were prescribed. Out of which, only 880 (61.2%) of the drugs had dosage mentioned and about 151 (27.1%) of the drugs with dosage not mentioned pertained to fixed-dose combinations (FDCs). However, 1416 (98.5%) and 1381 (96.1%) of the drugs had frequency and duration mentioned, respectively. Despite the fact that only 249 (17.3%) of the drugs were written in capital letters, 537 (97.8%) of the prescriptions were written legibly and hardly 3 (0.5%) of the prescriptions were graded as average (most words are illegible) [Table 2 and Figure 1].

The WHO core prescribing indicators analysis revealed that the average number of drugs per encounter was 2.38 ± 1.1 and the percentage of drugs prescribed by generic name was 796 (55.4%). Only 44 (7.3%) of the prescribed drugs were antibiotics and also merely 63 (10.5%) of the drugs were prescribed as an injection. About 1265 (88%) of the drugs were prescribed from NLEM [Table 3].

Out of the total 1437 drugs, about 217 (15%) of the drugs were FDCs. Of which, the percentage of FDCs not prescribed from NLEM was 133 (9.25%).

Table 1: Sociodemographic details and completeness of the prescription in relation to patient and prescriber identifiers, diagnosis, and instructions

Variables	Number of prescriptions/ encounters, n (%)
Total number of prescriptions (n)=600	
Age	44.03±15.4
Gender	
Male	284 (47.3)
Female	316 (52.7)
Patient identifiers	600 (100)
Prescriber identification	478 (79.7)
Diagnosis	496 (82.7)
Instructions	589 (98.2)

Data expressed as frequency and percentages

Table 2: Completeness of the prescription with regard to the dosage regimen of the total drugs prescribed

Variables	Number of drugs prescribed, n (%)
Total number of drugs prescribed (n)=1437	
Capital letters	249 (17.3)
Dosage	880 (61.2)
Frequency	1416 (98.5)
Route	1424 (99.1)
Duration	1381 (96.1)

Data expressed as frequency and percentages

Table 3: Results of world health organization core prescribing indicators (total encounters=600; total drugs=1437)

Core prescribing indicator	Total drugs/ encounters	Values
Average number of drugs prescribed per encounter [†]	1437	2.38±1.1
Percentage of drugs prescribed by generic name	796	55.4
Percentage of encounters with an antibiotic prescribed	44	7.3
Percentage of encounters with an injection prescribed	63	10.5
Percentage of drugs prescribed from the National List of Essential Medicines	1265	88

Data expressed as frequency and percentages; [†]mean±SD. SD: Standard deviation

DISCUSSION

Based on the WHO core prescribing indicators, a total of 600 prescriptions were analyzed. Apart from the primary use of WHO core prescribing indicators in evaluating the prescriptions, a secondary level follow-up assessment based on the diagnosis and treatment was undertaken to scrutinize the core drug indicators in issue.^[3] In this study, the average number of drugs per prescription was 2.38 ± 1.1 , which is lower than the prescription audit done in a rural hospital setting.^[9] However, the optimal value recommended by the WHO is 1.6–1.8 drugs per encounter. The higher number of drugs per encounter in this study was further followed up by evaluating the diagnosis for which the drugs were prescribed. It was found that the majority of

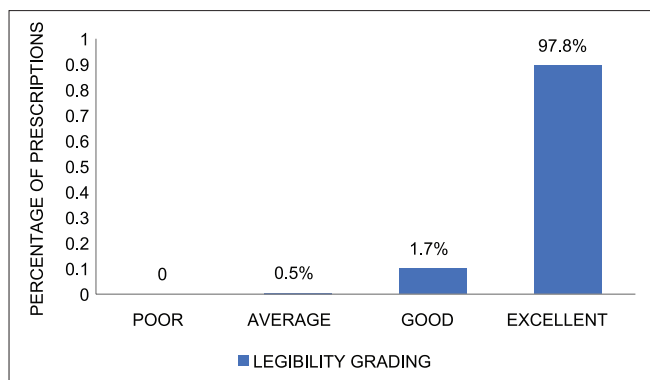


Figure 1: Legibility grading of the prescriptions sampled

the prescriptions were prescribed for patients with multiple diseases indicating polypharmacy to be appropriate.

The percentage of drugs prescribed by generic name in this study was 55.4% compared to a study done at secondary level hospitals in Maharashtra, wherein 60% of the drugs were prescribed in generic name.^[10] In this study, the majority of the prescriptions had at least one or more drugs prescribed with generic names which could be attributed to the regular prescription audit by the hospital followed by feedback to prescribe by generic names. Further, to promote generic prescribing, in 2018, the Drug Technical Advisory Board of India has recommended to provide a discrete area, especially for generic medicines in pharmacies along with displaying a signboard mentioning “Generic medicines are also available” at prominent places within the premises of the hospital.^[11]

The percentage of antibiotics prescribed was optimal at 7.3% compared to the WHO recommendation (20%–26.8%).^[9] One of the main reasons could be due to the hospital policy on rational use of antibiotics such as selective reporting of antimicrobial susceptibility to minimize the inadvertent use of high end and reserve drugs.

This study also revealed a lower percentage (10.5%) of drugs prescribed as injection as against the optimal value (13.4%–24.1%) recommended by the WHO.^[12] Oral route was the major route of administration noted in our study. Considering the low rate of injectables prescribed, the practice of use of injections mainly at the accident and emergency department in the hospital could be taken into account.

The percentage of drugs prescribed from the NLEM was about 88% in this study. This is in contrast to the finding done by a study done at rural pharmacies in South India where 99.8% of the drugs were prescribed from NLEM.^[13] Further evaluation revealed that more than two-third of the drugs that were not prescribed from the NLEM were FDCs.

All of the prescriptions were complete pertaining to patient identifiers as the patient details are labeled in all the prescriptions with printed stickers with details such as name, age, sex, and hospital registration number. Similar findings were also seen in a study done by Singh *et al.* wherein the reason was also due to printed details.^[9] Almost 98.2% of the prescriptions had advice to follow-up, but the prescriber identifiers and diagnosis were mentioned only in about 79.7% and 82.7% of the prescriptions, respectively. Out of the 1437 drugs were prescribed, about 880 (61.2%) of the drugs had dosage mentioned compared to the study done in secondary level hospital settings wherein dosage was mentioned only in 38.8% of the tablets.^[10] Missing out prescriber’s signature and dosage of drug formulations are potential risks of medication errors. Switching over to electronically generated prescriptions could minimize the rate of errors with regard to completeness and legibility of the prescriptions compared to handwritten ones.^[14]

Consequently, this study highlights that implementing strategies by the hospital to curb inadvertent use of antibiotics and by establishing guidelines on the use of injections in OPD would pave the way for more rational use of medicines and ultimately to a better health care to the community.

Moreover, prescription audits done at various institution levels would aid to compare drug use pattern and provide suggestions to improve prescribing behavior among the institutes.

The limitation of the study is that inclusion of patient-care indicators and complementary drug use indicators would have described the patient’s perspectives on health facilities and their compliance to pharmacotherapy.

CONCLUSION

It is evident from the prescription pattern audit done using the WHO prescribing indicators, the prescribing pattern of antibiotics, and injection use were in accordance with the WHO standard recommendations. Regular audit by the hospital on prescription pattern and prescribing behavior, followed by constructive feedback and continuing medical education on good prescribing habit adhering to clinical guidelines, ensures quality health care.

Acknowledgment

The authors thank the Medical Superintendent of the Hospital.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

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