RESEARCH ARTICLE

Prescription auditing using the WHO drug prescribing indicators in a tertiary care hospital: An observational retrospective study

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Received: December 28, 2021; Accepted: January 20, 2022

ABSTRACT

Background: Prescription auditing is an important tool to assess and evaluate the drug utilization pattern and rational use of medicines. A successful prescription audit is crucial for health care workers, patients, and the community to ensure that their patients receive the best possible treatment. The purpose of drug audit is to improve patients care and to avoid potential fatal errors. **Aim and Objectives:** This study has been conducted to evaluate and analyze existing prescription errors in tertiary care hospital of Rajasthan and their magnitude. **Materials and Methods:** A retrospective observational study was carried out in Jhalawar Medical College, a tertiary care hospital in Rajasthan. Around 1000 prescriptions were collected randomly from medical college pharmacies. Outpatient prescriptions from all the major clinical departments available at hospital pharmacies were analyzed using the WHO prescribing indicators. Information regarding the patient, doctor, drug, and legibility of the prescription were obtained. **Results:** In our study, we found that most common age group mentioning in prescriptions were 18–60 years (55.7%), most common gender are males (60.2%). Generic names were prescribed in all prescriptions (100%). Patient information was mentioned in 73.2% prescriptions. Warning signs were not mentioned in any prescription whereas 10.2% prescription mentioned medicines name in capital letter. Average number of medicines per prescription was 4.1. Prescription with drugs prescribed from essential drug list was 88%. **Conclusions:** In our study, we found many insufficiencies, lack of clarity and important instructions in different parts of prescriptions. There is immediate requirement of improvement in prescribing habits of doctors. Proper steps such as workshops, practical training, and continuing medical education should be needed to guide the physicians to promote rational prescription.

KEY WORDS: Medical Audit; Prescription; Prescribing Indicators; Rationality; Health Care Workers

INTRODUCTION

Medical audit is defined as evaluating and scrutinizing at what health care workers (HCWs) are doing with the main aim of enhancing and improving patient care and use of resources.[1]

Medical audit is an quality approach to scrutinize and review medical care to identify opportunities for betterment of patients and community.[2-3] Prescription audit is an integral portion of medical auditing.[4]

Prescription is a written document prescribed by a doctor to take care of health of the patient with help of pharmacist or nurse as a chief mediator in pharmacotherapy. If this written document is mis-interpreted at any level, it can lead to wrong treatment, exaggeration of the disease, health problems, and monetary loss of the patients and wastage of important resources. Medication error is caused due to prescribing faults and prescribing errors. Prescribing errors
account for 70% of medication errors that may cause adverse effects or the failure of pharmacotherapy. An average value of prescribing errors with the potential for adverse drug reactions (ADRs) in patients is around 4 in 1000 prescriptions that were analyzed in a teaching tertiary care hospital.[5-7] Recent meta-analysis showed that the frequency of mistakes caused by junior residents and interns who are accountable for most prescriptions in hospitals, can vary from 2 to 510/1000 prescriptions and from 5.2 to 72% of patients.[8]

Apart from rational drug prescribing, right format of prescription is also crucial. The World Health Organization (WHO) propose minimum set of informations as core criterias to be written on a prescription to ensure perfect prescribing.[9] Irrational details on prescription is one of the important causes of medication error leading to failure of treatment or risk of toxicity. Any misinterpretation and misreading in transcription of prescription by a pharmacist or nursing staff can cause dispensing of a wrong drug or wrong doses that may prove serious to the life of the patient or failure of the treatment.

Prescription errors are avoidable forms of medication errors and there is a great hope for advancement and refinement in this field. It is better to watch the magnitude of the problem, before trying to improve it. Prescription audit is a facility level review exercise, conducted regularly and repeatedly, for reviewing the facility’s prescriptions. It helps in assessing the extent of Outpatient Department (OPD) patient-related information written on the prescriptions, prescribing habits of HCWs, suitableness of drug usage and its accessibility, drug dispensing practices and workload of the pharmacist. Prescription audit is a refinement activity, and if periodically done, it ensures that the patients perceive exceptional care, which is unbiased, cheap and efficient.[10] There is immense requirement of improvement in prescribing habits of doctors and nursing staff. Proper steps like workshops, practical training, continuing medical education (CME) should be needed to guide the physicians to promote rational prescription. Therefore, this study has been conducted to evaluate and analyze existing prescription errors in tertiary care hospital of Rajasthan and their magnitude.

MATERIALS AND METHODS

This retrospective observational study was carried out in Jhalawar Medical College and Hospital, a tertiary care center in Rajasthan. One thousand OPD prescriptions photocopies were randomly acquired from pharmacy stores situated in Medical College Hospital after taking written informed consent from the Institutional Ethics Committee. Evaluation and analysis were done on various parameters written in these documents which were as follows.

Different Components of the Prescription

- Superscription mentioning personal information (name, age, address, sex, weight), date and provisional diagnosis.
- Subscription mentioning name and dose of drugs.
- Inscription mentioning instructions given to the pharmacist.
- Transcription is instruction to the patients about the methods of administration.
- Use of abbreviations.
- Legibility of prescription.
- Medicine name in Capital letter.
- Warning signal of adverse effects.
- Signature of doctor.

WHO Core Prescribing Indicators and Formulas

1. Average number of drugs per prescription was calculated by formula:
   
   \[ \frac{\text{Dividing the total number of prescribed drugs by the total number of prescriptions assessed.}}{100} \]

2. Percentage of drugs mentioning generic title was calculated by formula:
   
   \[ \frac{\text{Ratio of the number of medicines prescribed by generic title to the total number of medicines prescribed, multiplied by one hundred.}}{100} \]

3. Percentage of antibiotics per prescription was calculated by formula:
   
   \[ \frac{\text{Ratio of the number of prescription in which an antibiotic was prescribed to the total number of prescription assessed, multiplied by one hundred.}}{100} \]

4. Percentage of injections per prescription was calculated by formula:
   
   \[ \frac{\text{Ratio of the number of prescription in which injectable medicine was mentioned to the total number of prescription assessed, multiplied by one hundred.}}{100} \]

5. Percentage of medicines prescribed from the essential drugs list (EDL) was calculated by formula:
   
   \[ \frac{\text{Ratio of the number of medicines mentioned from the EDL to the total number of medicines prescribed, multiplied by one hundred.}}{100} \]

Ethics

Institutional Ethics Committee permission was obtained before starting our study.

Inclusion Criteria

Prescriptions from hospital pharmacies of Jhalawar Medical College and Hospital.

Exclusion Criteria

Illegible and torn prescriptions and prescriptions from casualty, infectious disease unit, Intensive care units (ICU), Tuberculosis and Chest unit and HIV department.
Statistical Analysis
All the data acquired were entered in Microsoft excel worksheet. Descriptive statistics number and percentages were calculated.

RESULTS
In our study, we found that most common age group mentioning in prescriptions were 18–60 years (55.7%), most common gender are males (60.2%) as shown in Table 1. Patient information was mentioned in 73.2% prescriptions. Prescriber information was mentioned in 69.8% of prescriptions. Prescriptions with more than 5 drugs were in 71.4% prescriptions. Warning signs were not mentioned in any prescription, whereas only 10.2% prescription mentioned medicines name in capital letter as shown in Table 2. Drugs with generic title were prescribed in all prescriptions (100%). Average number of drugs per prescription was 4.1. Prescription with drugs prescribed from essential drug list were 88%. Prescriptions with injectable were less (6.9%) as shown in Table 3.

DISCUSSION
In our study, the average number of drugs per prescription was 4.1 which is more than WHO standards so the risk of drug interactions and its serious consequences were more in our study. This indicates that doctors were ignorant regarding polypharmacy. Polypharmacy may hinder patient’s acceptance to the prescribed drugs and may also increases the possibilities and chances of drug-drug interactions. The cost associated with the control and of drug interactions can lead to huge monetary loss of the patients. The prescriptions containing antibiotics was 36.7% in our study (WHO standards<30%) which is slightly more. According to the WHO guidelines indiscriminate use of antimicrobials predispose to increase risk of antimicrobial resistance. An good score of 6.9% in comparison to the WHO guidelines (<10%) mentioning prescriptions with injectables were observed in our study. Avoiding unnecessary injectable when equivalent oral medicines are available helps in time conservation in busy OPD schedule reduces unnecessary pain and cost inflicted to patients.

A comparison of various similar studies applying WHO drug prescribing indicators with the present study is showed in Table 4.

All drugs in our study were prescribed by generic label (100%). Prescribing by generic names allow the pharmacist to give rational drugs. Therefore, it makes the treatment cheap and convenient. Prescribing by generics names can also avoid pharmacist to dispense wrong drug due to similar sounding brands.

The percentage of drugs prescribed from EDL in our study was 88%, (WHO standards 100%) which shows that our physicians were aware of essential drug list. Prescribing from essential drug list also brings down the monetary burden on the patients, because the cost of branded drugs and their newer alternatives can be overwhelming and unaffordable.

Strength of the Study
The study involved scrutiny of prescriptions from almost all the major clinical department of Jhalawar medical college. Prescriptions were audited for their rationality and completeness using the WHO prescription indicators.

Limitations of the Study
The total number of prescriptions evaluated were not much in number and noninclusion of indoor and ICU patients was

### Table 1: Demographic pattern mentioned in prescriptions

<table>
<thead>
<tr>
<th>Distribution</th>
<th>Number of prescription (n)</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age group</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;18 years</td>
<td>332</td>
<td>33.2</td>
</tr>
<tr>
<td>18–60 years</td>
<td>557</td>
<td>55.7</td>
</tr>
<tr>
<td>&gt;60</td>
<td>111</td>
<td>11.1</td>
</tr>
<tr>
<td>Sex</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>602</td>
<td>60.2</td>
</tr>
<tr>
<td>Female</td>
<td>398</td>
<td>39.8</td>
</tr>
</tbody>
</table>

### Table 2: Prescription related informations

<table>
<thead>
<tr>
<th>Prescription-related information</th>
<th>Prescriptions n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient information (age, weight, address, date)</td>
<td>732 (73.2)</td>
</tr>
<tr>
<td>Prescribers information (name, qualification, registration and contact number of prescriber)</td>
<td>698 (69.8)</td>
</tr>
<tr>
<td>Legibility</td>
<td>826 (82.6)</td>
</tr>
<tr>
<td>Diagnosis or complains mentioned</td>
<td>903 (90.3)</td>
</tr>
<tr>
<td>Use of abbreviations</td>
<td>792 (79.2)</td>
</tr>
<tr>
<td>Medicine name in capital letter</td>
<td>102 (10.2)</td>
</tr>
<tr>
<td>Medicine prescribed by generic label</td>
<td>1000 (100)</td>
</tr>
<tr>
<td>Prescriptions with more than 5 medicines</td>
<td>714 (71.4)</td>
</tr>
<tr>
<td>Use of fixed dose combinations</td>
<td>679 (67.9)</td>
</tr>
<tr>
<td>Writing of warnings signal of any adverse effect</td>
<td>0 (0)</td>
</tr>
<tr>
<td>Non-pharmacological management or instruction to patients</td>
<td>230 (23)</td>
</tr>
<tr>
<td>Doctor’s signature</td>
<td>811 (81.1)</td>
</tr>
</tbody>
</table>

### Table 3: Prescription auditing using the WHO prescribing indicators

<table>
<thead>
<tr>
<th>WHO indicators</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average number of drugs per prescription</td>
<td>4.1</td>
</tr>
<tr>
<td>Percentage of prescription with antibiotics</td>
<td>36.7</td>
</tr>
<tr>
<td>Percentage of prescription with an injectables</td>
<td>6.9</td>
</tr>
<tr>
<td>Percentage of drug prescription with generic title</td>
<td>100</td>
</tr>
<tr>
<td>Percentage of drugs from essential drug list</td>
<td>88</td>
</tr>
</tbody>
</table>
a limitation of this study and may not be totally generalized to all prescriptions.

**CONCLUSIONS**

Our study show that there is need for improvement in prescribing habits of HCWs such as legibility, prevention of abbreviated words, use of capital letters in prescriptions, use of generic names, preventing unwanted, and irrational polypharmacy. To enhance the rationality of prescriptions, there should be habit of righting nonpharmacological measures and signs and symptoms predicting ADRs. Regular CME, lectures, workshop, training seminars, and prescription audit must be incorporated in health care providers schedule to change their prescribing habits.

**REFERENCES**


How to cite this article: Jhanwar A. Prescription auditing using the WHO drug prescribing indicators in a tertiary care hospital: An observational retrospective study. Natl J Physiol Pharm Pharmacol 2022;12 (Online First). DOI: 10.5455/njppp.2022.12.01017202220012022

Source of Support: Nil, Conflicts of Interest: None declared.