

Assessment of WHO Prescribing Indicators and Utilization Trends of Fixed Drug Combinations, Corticosteroids and Non-Steroidal Anti-Inflammatory Drugs in General Medicine Department at a Tertiary Care Centre in Uttarakhand

Libin Sanjeev Leonson¹, Shikha Dwivedi², Prateek Chaudhary³,
Annwasha Chaudhury⁴, Rakshanda Doomra⁵, Ayush Jain⁶

¹Department of Pharmacology, Shri Guru Ram Rai Institute of Medical & Health Sciences, Dehradun, Uttarakhand, India.

²Department of Pharmacology, Government Doon Medical College, Dehradun, Uttarakhand, India.

³Department of Pharmacology, Government Doon Medical College, Dehradun, Uttarakhand, India.

⁴Department of Pharmacology, Vydehi Institute of Medical Sciences and Research Centre, Bengaluru, Karnataka, India.

⁵Department of Pharmacology, Government Doon Medical College, Dehradun, Uttarakhand, India.

⁶Department of Pharmacology, King George's Medical University, Lucknow, Uttar Pradesh, India.

Corresponding Author: Prateek Chaudhary

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ABSTRACT

Background: While rational prescribing is crucial for effective and safe healthcare delivery, irrational prescription practices remain a significant challenge in India. High patient volumes in Internal Medicine outpatient departments (OPDs) often exacerbate drug supply shortages and increase the clinical and financial burden of inappropriate prescribing.

Objective: This study aimed to conduct a prescription audit in the Department of General Medicine at a tertiary care center in Uttarakhand to evaluate World Health Organization (WHO) core prescribing indicators and assess the utilization trends of Fixed-Dose Combinations (FDCs), corticosteroids, and non-steroidal anti-inflammatory drugs (NSAIDs).

Methods: An observational, cross-sectional prescription audit was conducted over a

three-month period. Using convenience sampling, 618 prescriptions issued by general medicine practitioners for outpatients were analyzed. Data encompassing patient demographics and prescribed medications were collected and evaluated using descriptive statistics.

Results: Out of 618 prescriptions, endocrine disorders, predominantly diabetes (23.20%), were the most frequent indications. Assessment of WHO core indicators revealed an average of 4.10 drugs per encounter, highlighting a tendency toward polypharmacy. Only 29.22% of medications were prescribed by their generic names, and 77.27% were selected from the Essential Medicines List. Antimicrobial agents were prescribed in 29.87% of encounters, while injections were utilized in just 1.30%. Additionally, a high burden of FDCs (72.08%) and NSAIDs (37.01%) was

observed, with corticosteroids present in 7.79% of the prescriptions.

Conclusion: The prescribing patterns observed in this study reveal significant deviations from WHO optimal standards, particularly regarding polypharmacy, low rates of generic prescribing, and the heavy utilization of antibiotics and FDCs. Implementing regular prescription audits and continuous medical education is vital for promoting rational drug use, reducing healthcare costs, and mitigating antimicrobial resistance.

Keywords: Inappropriate Prescribing, Polypharmacy, Drug Utilization Study, Outpatient Clinics, Hospital

INTRODUCTION

With the modernization of medicine, there comes an increased responsibility of physicians to prescribe medicines according to the patient's requirements and needs. However, irrational prescription practices remain common in India despite the availability of modern diagnostic tools and interventions. Internal Medicine has the highest number of patients coming to OPD (Outpatient Department) in any hospital and having such a huge burden of patients leads to a shortage of drug supplies and the burden is further added due to irrational prescriptions.¹ Inappropriate prescriptions can lead to an increase in adverse drug reactions, hospitalization, and increased cost of treatment.^{2,3} The utilization pattern of drugs in outpatient departments (OPDs) of healthcare facilities shows the healthcare situation and the overall effectiveness of healthcare delivery systems.

Evaluating drug prescription patterns is important for ensuring patient care and helps in identifying inappropriate prescribing patterns which is vital for healthcare quality and efficiency. Therefore, understanding prescription patterns also provides an opportunity to assess the level of adherence to clinical guidelines which can contribute to more safer and effective

healthcare delivery system as well as reduces the financial burden on patients.

Hence our study aimed at conducting a prescription audit in a general medicine department, while concurrently estimating the burden of non-steroidal anti-inflammatory drugs (NSAIDs) and Fixed drug combinations (FDCs) in general.

MATERIALS & METHODS

The study was designed as an observational cross-sectional prescription audit conducted in collaboration between the Department of Pharmacology and the Department of General Medicine at Government Doon Medical College, Uttarakhand. The study was carried out over a period of three months. Convenience sampling was used to select the prescriptions for analysis. All prescriptions written by general medicine practitioners for outpatients during the study period were included, while prescriptions from other departments and those that were unclear or incomplete were excluded.

Prescription data, including patient demographics and details of prescribed drugs (such as injections, AMAs, and FDCs), were collected from the prescription forms. The collected data were entered into Microsoft Excel for analysis and descriptive statistics were applied. Ethical approval for the study was obtained from the Institutional Ethics Committee (IEC), and patient confidentiality was strictly maintained through anonymization of the data. Informed consent was obtained from patients when necessary.

RESULT

This study revealed that out of 618 prescriptions, there were 230 male patients, making up 37.21% of the total, while 388 female patients, accounted for 62.79%. The data indicated a diverse age distribution among the participants, with the majority (22.34%) being in the older adult category (51-60 years). The lowest (7.76%) representation was in the youngest age group (11-20 years). [Fig-1]

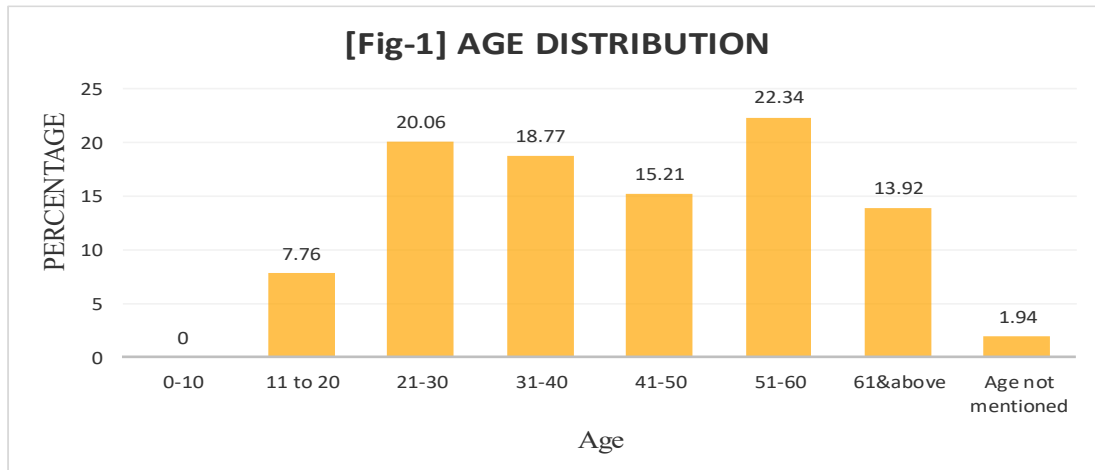


Figure 1 - Age Distribution

Analysis of diagnoses [Fig – 2] revealed that endocrinological disorders were the most prevalent, diabetes being the most common, accounting for 23.20% of cases. Haematological disorders, including anaemia and polycythaemia, were relatively

uncommon, comprising only 1.86%. This highlighted the significant burden of endocrine and gastrointestinal disorders within the population during the study period.

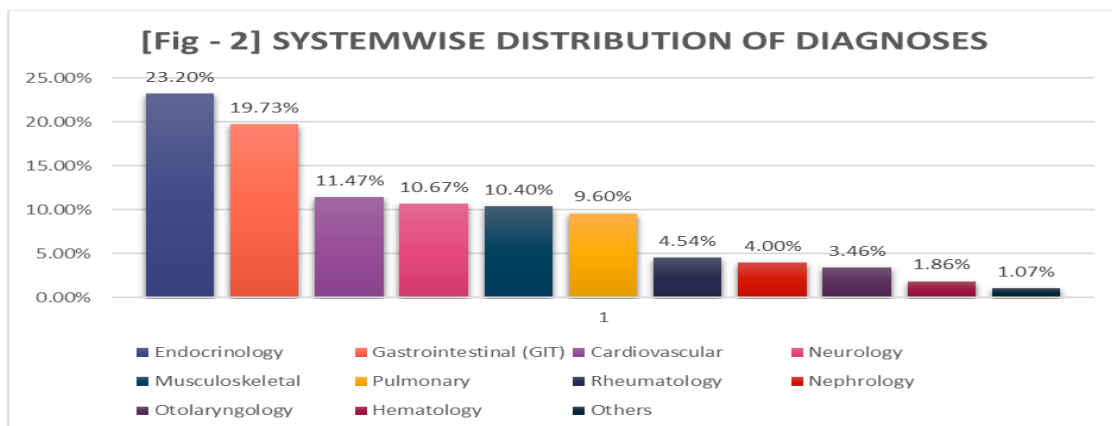


Figure 2 - System-wise distribution of Diagnoses

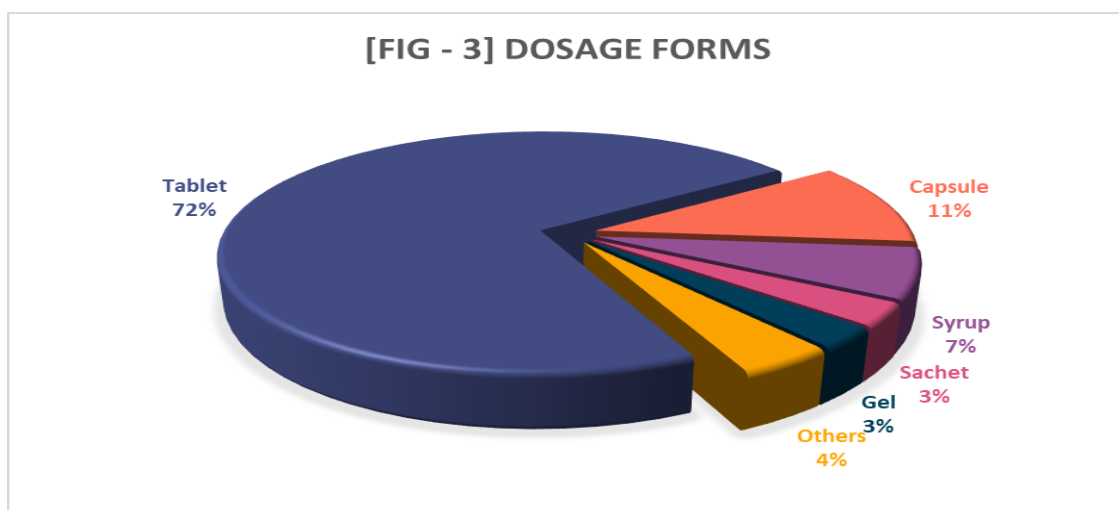


Figure 3 - Distribution of Dosage Forms

Tablets (72.32%) and capsules (11.04%) were the most frequently prescribed dosage forms reflected the common use of oral medications. Injections, at 1.36%, were

reserved for more severe cases requiring immediate or parenteral intervention. The distribution of dosage forms is depicted in [Fig – 3]

Table 1- WHO Core Prescribing Indicators

Indicator	Study value	WHO Standard ⁴
Average number of drugs per encounter.	4.10	1.6-1.8
Percentage of drugs prescribed by generic name.	29.22%	100%
Percentage of drugs prescribed from the EML	77.27%	100%
Percentage of prescriptions containing Injections.	1.30%	20%
Percentage of prescriptions containing AMAs.	29.87%	20-26.8%

[Table – 1] evaluates key prescribing indicators against WHO standards. The average number of drugs per encounter (4.10) is higher than recommended (1.6–1.8). The percentage of drugs prescribed by generic name is 29.22%, much lower than the ideal 100%. Similarly, 77.27% of drugs were prescribed from the Essential Medicines List, again short of the WHO target of 100%. Conversely, only 1.30% of prescriptions involved injections, which is well below the upper WHO standard of 20%. Finally, antimicrobial use stood at

29.87%, slightly above the recommended range of 20–26.8%.

The prescriptions were also checked for completeness and the study found out that Allergy status (13.6%), date of next visit (16.2%) and follow up advice (32.5%) were the least scoring attributes. Although 73% of the prescriptions were found to be legible, none of the 618 prescriptions had the drug names in full capital letters. The findings regarding completeness of prescriptions are depicted in [Fig – 4]

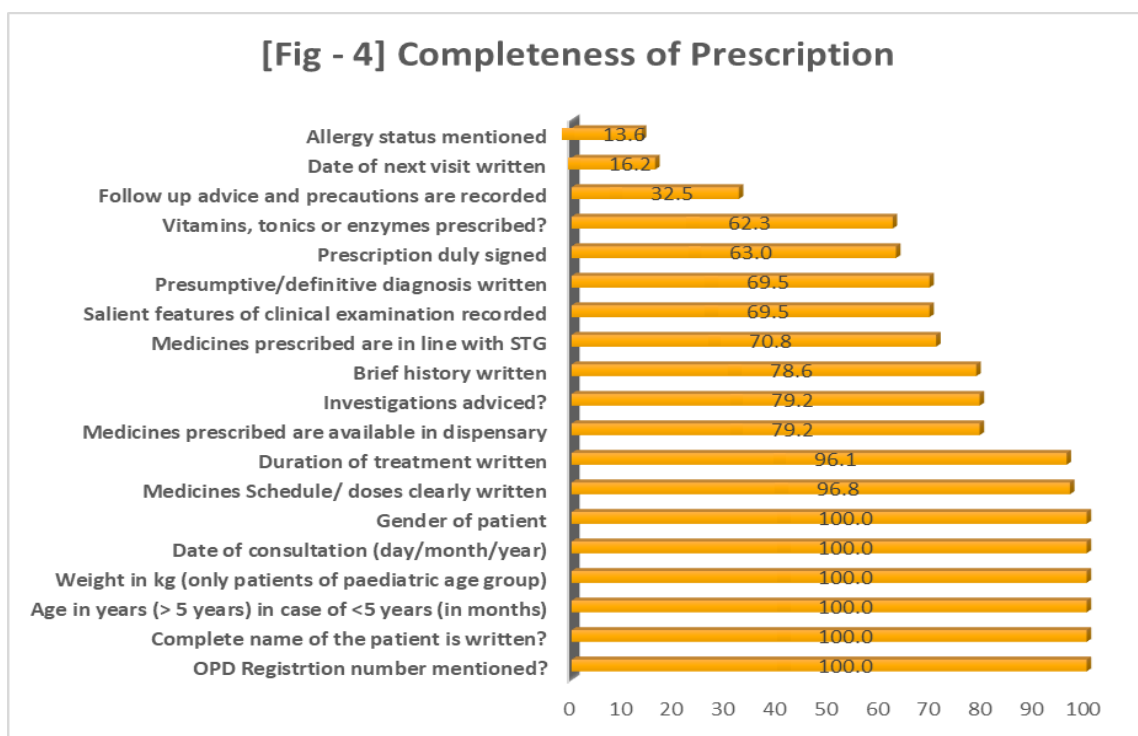


Figure 4 - Completeness of Prescriptions

Table 2- Burden of NSAIDs, Corticosteroids and FDCs

Parameter	Study value
Percentage of prescriptions containing Corticosteroids.	7.79%
Percentage of prescriptions containing NSAIDs.	37.01%
Percentage of prescriptions containing FDCs.	72.08%

[Table – 2] presents additional prescription parameters. Corticosteroids were included in 7.79% of prescriptions. NSAIDs were prescribed in 37.01% of cases. Fixed-Dose Combinations (FDCs) were found in 72.08% of prescriptions. These figures outline the specific drug classes and formulations commonly used in the prescriptions studied.

DISCUSSION

The study findings conducted in the Internal Medicine OPD at a tertiary care hospital in Uttarakhand suggested various areas where there was a need for improvement and a requirement for continuous auditing to improve healthcare quality.

With an average of 4.10 drugs prescribed per patient encounter, this exceeded the World Health Organization's recommended limit of 2 drugs per prescription, pointing toward the issue of polypharmacy, which can lead to higher risks of adverse drug reactions, increased costs, and poor patient compliance.⁴ In contrast, similar findings in other prescription audits, such as the dermatology department study by Sargwan et al.⁵ have 3.46 drugs per encounter, Sangeeta Lakshmi GNS et al.⁶ have 3.73 and 3.59 drugs per prescription for male and female OPD respectively, where polypharmacy also contributed to unnecessary healthcare costs, adverse drug reactions, and potential drug interactions.

In this study, only 29.22% of drugs were prescribed by their generic names, compared to the Mittal et al.⁷ Drug utilization study where 21.5% of prescriptions were issued by generic names, which was only 56% in Dwivedi et al.⁸ This highlights the need for further intervention in promoting generic prescribing as

according to WHO standards it should be 100%. Although Sangeetha Lakshmi GNS et al.⁶ had a higher percentage of drugs prescribed by their generic name which was 84.18% and 77.3% in male and female OPD respectively.

Antibiotic prescription patterns were also an area of concern, with 29.87% of prescriptions containing antibiotics. While antibiotic usage was very high (66.7%) in Mittal et al.,⁷ found to be above the WHO recommended range of 20-25%. This over-prescription of antibiotics could further raise up the already alarming rise of antimicrobial resistance (AMR), posing long-term risks to public health. Thus, as per WHO, Rational antibiotic use is critical in preventing the spread of resistant strains of bacteria. However, in Annwasha et al. it was only 13.3% and 15.91% in Anuj Kumar Pathak et al.⁹ which was below the WHO recommended range and possessed potential benefits like reduced risk of resistance, improved safety and cost savings for healthcare systems, especially important in resource-limited settings.

Another area of concern was the handwriting of the physicians, which can also be highlighted in our study, Among the prescriptions that were analyzed in our study, although 73% were written legible handwriting, none of the prescriptions had drug names in capital letters. While in Sargwan et al. it was 48.55%, and Al-Worafi YM et al.¹⁰ shows only 11.9% in legible handwriting. The lack of legibility in handwritten prescriptions can lead to misinterpretation by pharmacists, which can result in medication errors, incorrect dosages, or even dispensing wrong drugs. Such issues compromise patient safety and increase the risk of adverse drug reactions.

Although adherence to the Essential Drugs List (EDL) was high at 77.27%, the need to ensure that all drugs are both clinically necessary and cost-effective remains crucial. The use of essential medications is vital for promoting rational drug use and ensuring patient safety, an issue similarly identified in other prescription audits. Furthermore, the study revealed that 70.8% of medicines prescribed were in accordance with Standard Treatment Guidelines (STG). This level of adherence highlights the effort to promote rational drug use, though it also points to an opportunity for improvement. By enhancing adherence to STG, better treatment outcomes can be ensured.

The predominance of oral dosage forms, particularly tablets (72.32%), is consistent with outpatient department trends, where ease of administration is preferred. However, the presence of injections in 1.36% of prescriptions, though it is below the WHO-recommended threshold. In contrast, a higher percentage (13.04%) of injection prescriptions in the dermatology audit shows department-specific prescribing patterns where injectable therapies may be more commonly indicated.

The study also highlighted the burden of NSAIDs (37.01%) among prescriptions from the general medicine department. Considering majority of the patients were being treated for Endocrine and gastrointestinal indications, this number does seem to be higher. The supernumerary (72.08%) presence of FDCs among the prescriptions also highlight the severity of polypharmacy. The low scoring attributes regarding completeness of prescriptions were also noted down and forwarded to the Drugs and Therapeutics Committee for further evaluation.

CONCLUSION

This study highlights significant areas for improvement in prescription practices, particularly concerning polypharmacy, generic drug use, and antibiotic prescribing. Regular prescription audits, adherence to

WHO-recommended core drug use indicators, and continuous education for healthcare providers can significantly enhance patient outcomes and the overall quality of healthcare delivery. The findings suggest the importance of promoting rational drug use to prevent adverse drug reactions, reduce healthcare costs, and mitigate the growing threat of antimicrobial resistance.

Declaration by Authors

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Conflict of Interest: The authors declare no conflict of interest.

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