



## ASSESSMENT OF DRUG UTILIZATION PRACTICE USING WORLD HEALTH ORGANIZATION INDICATORS IN A TERTIARY CARE TEACHING HOSPITAL: A CROSS-SECTIONAL STUDY

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### Abstract

**Objectives:** The irrational use of drugs poses a significant challenge worldwide that must be urgently addressed. The World Health Organization estimates that nearly half of all medications are improperly prescribed, which can harm patients and increase healthcare costs. This study evaluates drug prescribing patterns in the Medicine Outpatient Department of a tertiary care teaching hospital, based on WHO guidelines. Hence, this study was conducted to improve patient safety and health outcomes.

**Materials and Methods:** This was a cross-sectional study that analyzed drug prescribing patterns and evaluated prescription completeness using key parameters from the WHO's core drug use guidelines.

**Results:** The highest number of prescriptions was observed in the 45-54 age group, accounting for a maximum percentage (31.77%). Out of 384 prescriptions, an average of 2.38 drugs were prescribed per prescription. The percentage of drugs prescribed by generic name was low (9.64%). A notable 39.06% of the prescriptions were found to contain antibiotics, highlighting a significant overuse of antibiotics. However, Injection use (6.25%) of the encounters, a total of 651 drugs were used from the essential drug list. Most commonly prescribed drugs were for the gastrointestinal disorder.

**Conclusion:** The current study highlights a trend in inappropriate prescribing, particularly the overuse of antibiotics and the underutilization of generic drugs. Implementing an effective intervention program is crucial to encouraging healthcare providers to adopt more responsible prescribing practices.

**Keywords:** WHO Indicators, prescribing, rational use of drugs

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### Introduction

Drug utilization studies serve as effective resources for understanding the societal impact of medications. They establish a strong socio-medical and health economic foundation for informing healthcare decisions. Medical prescriptions should be properly and carefully reviewed because it is essential for statements with medicolegal value that can be used as evidence in court. <sup>[1]</sup> 50% of patients do not take their medications as directed, and over 50% of all medications are sold, prescribed, or distributed improperly worldwide. On the other hand, around one-third of people worldwide do not have access to the required medications. <sup>[2]</sup> Drug utilization research, as defined by the WHO (World

Health Organization), involves marketing, distribution, prescribing, and consumption of medications within a community, particularly highlighting the ensuing health-related, societal, and financial consequences.<sup>[3]</sup> The main goal of drug utilization research is to promote the well-advised use of medications within communities. A complete evaluation update of the consumption of prescription drugs is important, as practices are constantly evolving in order to address changing health needs of the population, treatment progress, new clinical guidelines, occurrence or outcome of market medicines, and changes of marketing and drug promotion guidelines. Due to this dynamic climate, it is imperative to meticulously document drug consumption models on the prescription to inform both clinical practice and research, also simultaneously identifying demographic subsets that may exhibit tendencies towards usage, misuse, and polypharmacy.<sup>[4]</sup> Irrational pharmaceutical consumption represents a significant global health challenge, resulting in inadequate and hazardous therapeutic interventions, extended durations of illness, detrimental effects on patients, and increased financial burden associated with medication. The judicious use of pharmaceuticals necessitates that patients obtain medications that are suited to their clinical conditions, in dosages that fulfill their specific individual needs for an adequate duration, at the minimal financial expense to themselves and their community.<sup>[5]</sup> Frequent evaluation of a health facility's prescription pattern aids in the application of drug procurement rules regarding drug prescribing practices, the identification of particular drug usage issues, and the promotion of rational medication orders.<sup>[6]</sup> Though numerous drug utilization studies have been conducted on diverse populations and in various Indian settings.<sup>[7-9]</sup> Therefore, this prospective study was conducted to evaluate the prescriptions of patients visiting the outpatient department in a tertiary care teaching hospital

## **Materials and Methods**

### **Study Area**

The study was conducted in the Department of Pharmacology in association with the Medicine Department at Dr. KNS Memorial Institute of Medical Sciences, a tertiary care teaching hospital in Barabanki.

### **Study Design**

It was a prospective cross-sectional observational study.

### **Study Population**

384 patients who were visiting the medicine OPD, after obtaining their informed consent, before commencing the study.

### **Study duration**

The study was conducted over a period of 6 months, after obtaining the permission and necessary approval from the institutional ethics committee (CR:IC/2024/72)

### **Inclusion criteria**

All prescriptions irrespective of patient gender and for patients above 18 years old.

### **Exclusion criteria**

Severely ill or IPD patients

## **Methods**

The study randomly collected prescriptions from the Medicine outpatient departments, scanned them for record-keeping purposes, and analyzed data from 384 prescriptions. We also noted the basic demographic details like age and sex. Data was thoroughly analyzed in line with the WHO's prescribing indicators

These are as follows:

1. The average number of drugs per encounter was calculated by dividing the total number of different drugs prescribed by the number of encounters surveyed. It is not relevant whether the patient actually received the drug.
2. Percentage of drugs prescribed by generic name was calculated by dividing the number of drugs prescribed by generic name by the total number of drugs prescribed, multiplied by 100.
3. Percentage of encounters with an antibiotic prescribed and Percentage of encounters with an injection prescribed were calculated by dividing the number of patient encounters during which an antibiotic or an injection is prescribed, by the total number of encounters surveyed, multiplied by 100
4. The percentage of drugs prescribed from the essential drugs list was calculated by dividing the number of products prescribed that are listed on the essential drugs list by the total number of products prescribed, and then multiplying by 100 (WHO).[3]

## Results

In the present study, the total number of selected prescriptions was 384, out of which 59.64% (229) were male prescriptions, followed by 40.36% (155) female prescriptions. The test of proportion indicated that the male prescriptions slightly exceeded the female prescriptions [Figure 1].

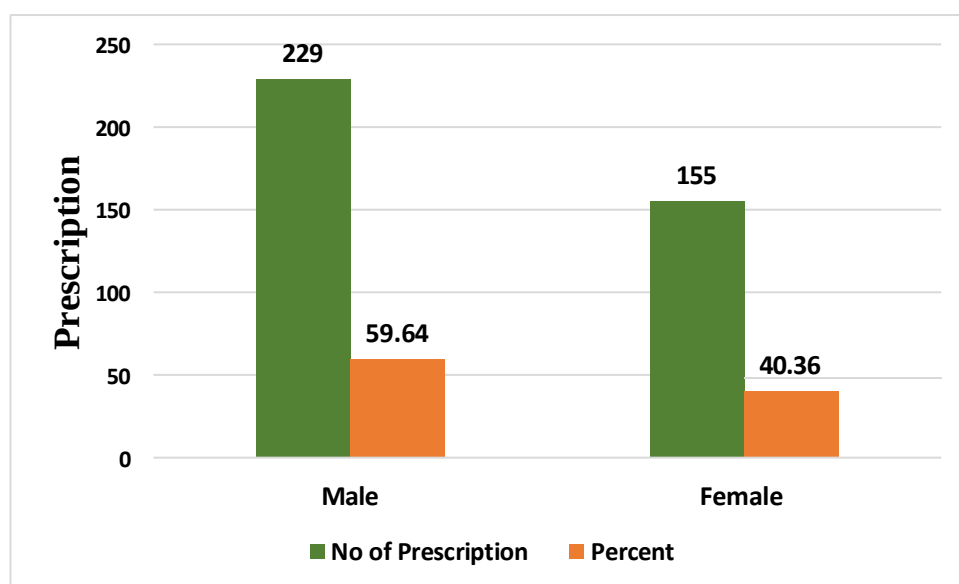


**Figure 1:** Gender-wise distribution with the Number and % of prescriptions

In the study, the highest number of prescriptions was found to be in the (45-54) age group, with a maximum percentage of (31.77 %) [Figure 2].

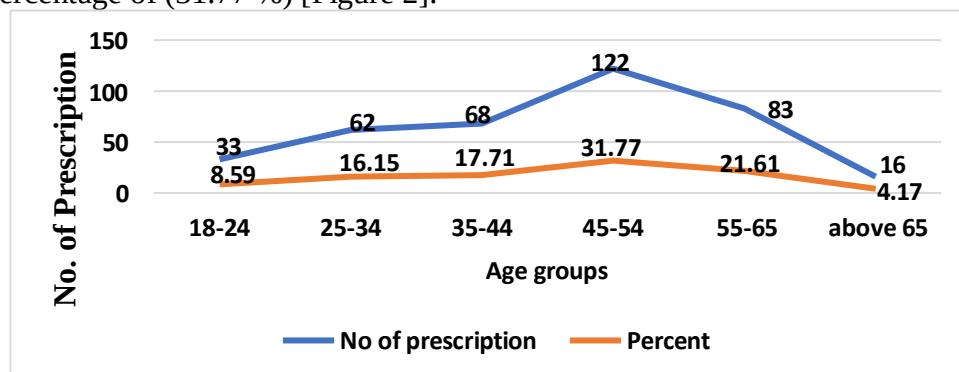


**Figure 2:** Percentage of prescriptions with various age groups

The average number of medications prescribed per encounter was 2.38, indicating that our institution demonstrates a commendable approach to managing polypharmacy. This reflects our adherence to ensuring patient safety and promoting treatment strategies.

The percentage of drugs prescribed by generic name was 9.64%. Out of 913 drugs, 88 drugs were prescribed by generic name, which can be increased by motivating practitioners.

A total of 150 out of 384 prescriptions were identified as containing antibiotics, representing a significant 39.06 %. This highlights the importance of WHO antibiotic use in our prescribing practices. Only 24 prescriptions for injections were identified. The percentage of encounters with an injection prescribed was 6.25 %, pointing to a judicious use of injections.

Out of a total of 913 drugs, 651 were found in the essential list of medicines, representing 71.30 %. This enhances the rationality of prescriptions. In our institute, a good number of practitioners are using drugs from the essential list of medicines [Figure 3].

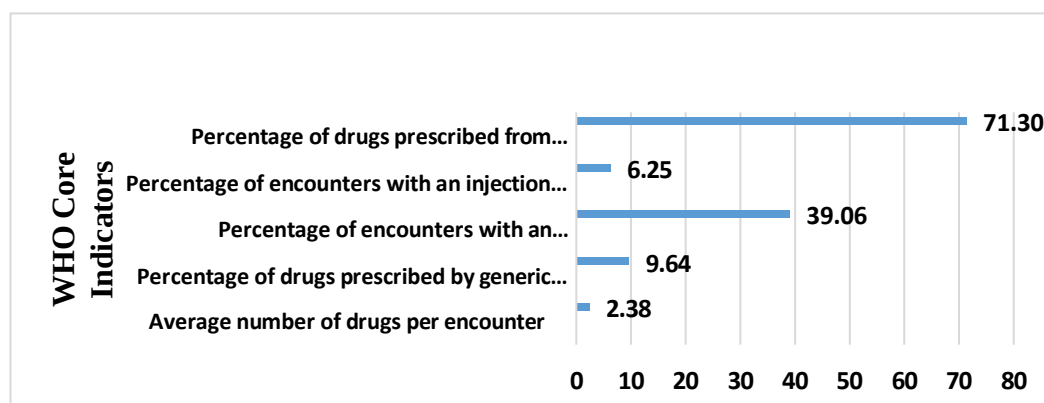


**Figure 3:** Prescribing trends of the study

Peptic ulcer was the most common case found in our study, and the least common was low back pain (25.6% & 6 %, respectively) [Table 1]

| Table 1: Most common diagnosis in the study (n= 384) |             |            |
|------------------------------------------------------|-------------|------------|
| Diagnosis                                            | No of cases | Percentage |
| GI disorder                                          | 133         | 34.6       |
| T2DM+HTN                                             | 99          | 25.8       |
| UTI & other infections                               | 65          | 16.9       |
| Thyroid disorder                                     | 34          | 8.9        |
| Anaemia                                              | 30          | 7.8        |
| Low back pain                                        | 23          | 6.0        |

The predominant drugs prescribed were Antiulcerants, followed by antidiabetics, antihypertensives, antibiotics, antithyroids, and haematinics, as well as NSAIDs. [Table 2]

| Table 2: Prescriptions include various groups of medicines (n = 384) |           |            |
|----------------------------------------------------------------------|-----------|------------|
| Medicines                                                            | Frequency | Percentage |
| Antiulcerants                                                        | 266       | 29.13      |
| Antidiabetics                                                        | 127       | 13.91      |
| Antihypertensives                                                    | 112       | 12.27      |
| Antibiotics                                                          | 199       | 21.80      |
| Antithyroids                                                         | 89        | 9/75       |
| Hematinics                                                           | 65        | 7.12       |
| NASIDs                                                               | 55        | 6.0        |

## Discussion

Recently, there has been a significant effort to promote rational drug use (RUD). The World Health Organization (WHO) has established specific indicators to assess medication use. These include the number of medications prescribed, the use of antibiotics and injections, the inclusion of generic names in prescriptions, and compliance with the Essential Drug List.<sup>[10,11]</sup> The average number of drugs per encounter in this study was 2.38. A survey by Geetha et al. reported a higher score of 3.68, notably exceeding our findings.<sup>[12]</sup> Slightly lower results were observed in a study conducted at a tertiary care hospital in Gujarat, which reported a value of 2.1.<sup>[12]</sup> In similar studies, the lowest recorded value was 1.65 in Zimbabwe.<sup>[13]</sup> Jordan reported an average of 2.3.<sup>[14]</sup> Since the World Health Organization (WHO) recommends an average of 2.0 medications prescribed per encounter, the current study indicates a slightly higher level of polypharmacy. This can lead to increased adverse drug reactions, increase the risk of drug interactions, cause dispensing errors, reduce medication adherence, and unnecessary drug costs.<sup>[15]</sup> The risk of drug interactions rises from approximately 6% for patients taking two medications to 50% for those taking five, and reaches 100% for individuals on ten medications.<sup>[16]</sup> Therefore, it is crucial to continually identify predictors of polypharmacy and revise prescribing practices. The percentage of drugs prescribed by generic name was found to be 9.64 % in this study, which is significantly lower than the rates reported in studies conducted in Cambodia (99.8%)<sup>[17]</sup>, Zimbabwe (90%)<sup>[13]</sup>, and Nepal (21.3%).<sup>[18]</sup> The declining rates of drug prescriptions using generic names in hospitals raise significant concerns that must be thoroughly investigated to ensure patient safety and cost-effectiveness in healthcare. Generic medicines are now widely manufactured in India, and there is significant price variation between different brands. When prescribing by generic name, pharmacists can dispense a less expensive brand, which helps reduce the overall cost of treatment.

In this study, we found that 39.06 % of encounters involved an antibiotic prescription, which is comparable with the results of Norway (48%).<sup>[15]</sup> In similar studies conducted, the antibiotic prescription was remarkably higher (39%).<sup>[19]</sup> The WHO recommends that injection exposure should be 10% or lower. In this study, the percentage of prescriptions that included an injection was 6.25 %, which is lower than the rate observed in a study conducted in India (13.6%).<sup>20</sup> However, we found that 67.25 % of drugs were prescribed from the essential medicine list. This is comparable to the same study (89%).<sup>[20]</sup>

## Conclusion

To promote rational drug use in our facility, it is essential to implement effective interventions. We must address the generic name of medicine, ensure accurate drug labeling, and establish access to an essential drugs list. These actions will significantly enhance patient care and safety. The prescribing of drugs from the Essential Drug List (EDL) and the average number of medications utilized were generally in line with expectations in this study. However, it is worth noting a minor deviation from the standard values recommended by the World Health Organization (WHO). This emphasizes the importance of following established guidelines for optimal patient care outcomes.

**Conflicts of Interest:** None

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