



AN EVALUATION OF DRUG PRESCRIPTION PATTERN AMONG OUTPATIENTS IN A TERTIARY CARE TEACHING HOSPITAL IN GUJARAT

Dr. Kinjal Modiya^{*1}, Dr. Dharna Patel², Dr. Kiran Panchal³,
Dr. Pavan Panchal⁴, Dr. Apexa Shukla⁵

^{1*}Departement of Pharmacology, Assistant professor, SAL Institute of Medical science, Ahmedabad, Gujarat, India, Email: drkinjalninama@gmail.com, Orcid number: 0009-0001-4119-6164, Phone Number:9099020537

²Departement of Pharmacology, GMERS Medical college, Himmatnagar, Gujarat, India, Email: p.dharna25@gmail.com

³Departement of Pharmacology, SAL Institute of Medical science, Ahmedabad, Gujarat, India, Email: kiranmpanchal77@gmail.com

⁴Departement of Pharmacology, GMERS Medical college, Himmatnagar, Gujarat, India, Email: drpavanpanchal@gmail.com

⁵Departement of Pharmacology, GMERS Medical college, Himmatnagar, Gujarat, India, Email: apexashelly@gmail.com

Abstract

Background: Assessing prescription practices is a crucial tactic for encouraging sensible medication usage and raising the standard of medical care. The World Health Organization's (WHO) core prescribing indicators form the basis for prescription audits, which offer an impartial method of evaluating drug use and pinpointing areas in need of improvement. Using WHO prescribing indicators, this study assessed outpatient prescribing patterns in a Gujarati tertiary care teaching hospital.

Materials and Methods: Over a period over a year, a cross-sectional observational study was carried out at GMERS Medical College in Himmatnagar. Written informed consent was obtained before newly registered outpatients from different clinical departments were enrolled. The completeness, readability, conformity with Standard Treatment Guidelines (STGs), adherence to WHO core prescription indicators, and prescribing from the National List of Essential Medicines (NLEM) were all evaluated. Descriptive statistics were used to analyze the data.

Results: A total of 1,639 medicines from 476 outpatient prescriptions were assessed. 94.2% of prescriptions had multiple medications, and the average number of medications prescribed per prescription was 3.3. Antimicrobials were prescribed in 36.3% of encounters, while vitamins and iron supplements were included in 36.0%. Fixed-dose combinations were present in 19.3% of prescriptions. Major deficiencies were identified in prescription documentation, with omission of patient instructions

(97.8%), follow-up advice (92.4%), diagnosis (65.0%), and drug dose (58.8%) being the most frequent.

Conclusion: Although prescribing practices demonstrated satisfactory adherence to STGs and appropriate documentation of dosage form, frequency, and route of administration, important deficiencies in prescription completeness and a high prevalence of polypharmacy were observed. Regular prescription audits, continuous prescriber education, and implementation of standardized or electronic prescribing systems may improve prescription quality, promote rational medicine use, and enhance patient safety.

Keywords: Prescription audit; Prescription pattern; Rational drug use; WHO prescribing indicators; Essential Medicines List; Standard Treatment Guidelines.

Introduction

Evaluating drug prescription trends is a crucial part of patient care and a key measure of the quality of healthcare. The World Health Organization (WHO) states that "patients receive medications appropriate to their clinical needs, in doses that meet their individual requirements for an adequate period of time, and at the lowest cost to them and their community" in order for medications to be used rationally.¹ Irrational prescription is still a serious global public health issue in spite of this advice. According to WHO estimates, over 50% of medications are prescribed, dispensed, or sold improperly globally, and nearly half of patients do not take their medications as prescribed, which leads to needless medical expenses, poor health outcomes, and the development of antibiotic resistance.¹

Inappropriate medicine selection, wrong dosage, dosage form, frequency, method of administration, or length of therapy are all examples of prescription errors that can happen at any point in the prescribing process. The risk of medication-related injury is further increased by incomplete prescriptions, unreadable handwriting, and dispensing mistakes.²

Adverse drug reactions, drug interactions, extended hospital stays, higher treatment costs, and antibiotic resistance are all consequences of irrational prescribing practices that lower the standard of patient care.³

Studies have shown significant variance in prescribing procedures and the completion of prescriptions across tertiary care hospitals in India, where healthcare facilities frequently face heavy patient loads and limited resources. Therefore, it is crucial to regularly assess prescribing practices in order to encourage the sensible use of medications, guaranty adherence to conventional treatment standards, and pinpoint areas that need correction.

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The WHO and the International Network for Rational Use of Drugs (INRUD) produced a collection of fundamental drug use indicators in 1993 to enable standard evaluation of medication use. These metrics, which are frequently used to assess drug use practices in healthcare settings, include prescribing, patient care, and facility characteristics. Each indicator's recommended ideal values allow for cross-institution comparison and aid in spotting departures from sensible prescription practices.^{5, 6}

By treating complicated and long-term illnesses and acting as training facilities for aspiring medical professionals, tertiary care teaching hospitals are essential to the provision of healthcare. Using WHO prescribing indicators, prescription audits carried out in tertiary care teaching hospitals have shown their value in assessing prescribing behavior, detecting polypharmacy, encouraging generic prescribing, evaluating adherence to the Essential Medicines List, and keeping an eye on the sensible use of injections and antibiotics.⁷

Thus, using the WHO/INRUD prescribing indicators, the current study was conducted to assess the prescription trends of outpatients visiting a tertiary care teaching hospital in Gujarat. The study sought to determine the percentage of prescriptions containing antibiotics and injections, the average number of medications prescribed each visit, the percentage of medications provided by generic name, and the percentage of medications recommended from the National List of Essential Medicines. It is anticipated that the results would reveal current prescribing gaps and offer baseline data for creating interventions to encourage sensible drug usage and raise the standard of patient care.

Materials And Methods

Study Structure and Environment

In cooperation with the outpatient departments of the affiliated teaching hospital, a cross-sectional observational study was conducted in the Department of Pharmacology at GMERS Medical College in Himmatnagar, Gujarat. The investigation was carried out from October 2024 to September 2025, a full year.

Ethical Acceptance

The Institutional Ethics Committee of GMERS Medical College, Himmatnagar, examined and accepted the study protocol (Approval No. IEC/Approval/43/09/04/2025). Before being included in the study, each subject provided written informed consent. Both English and the regional vernacular were offered as consent forms. Throughout the trial, patient information was kept private.

Study Population

The study included newly registered outpatients of all age groups and both sexes attending various outpatient departments during the study period. Only patients who voluntarily provided written informed consent were enrolled.

Patients who declined to participate, as well as prescriptions provided for hospitalized patients or upon hospital discharge, were dropped from the study.

Collection of Data -

Eligible participants were approached at the hospital pharmacy after completion of their outpatient consultation. Following informed consent, photographs of their prescriptions were obtained for documentation. Information from each prescription was transferred to a predesigned case record form, which included demographic details, clinical information, diagnosis, investigation findings (where available), and details of prescribed medications. Patient confidentiality was ensured by anonymizing all collected data before analysis.

Assessment of Prescriptions

Based on WHO prescribing guidelines and national prescription writing recommendations, each prescription was assessed using predetermined criteria.

1. Assessment of Prescription Completeness

The following elements were evaluated:

Prescriber details include name, registration number, qualification, designation, and signature.

Details about the patient: identification, age and gender, body weight, residence, and contact information.

Clinical information: A clinical indication or diagnosis.

Medication information includes the drug's name, dosage form, dose, method of administration, frequency, interval of treatment, non-pharmacological recommendations, and instructions for follow-up.

2. Analysis of Legibility

In order to reduce the likelihood of drug errors or dispensing errors, prescription readability was evaluated.

3. Core Prescribing Indicators of the WHO

The WHO/INRUD core prescription based indicators were used to assess prescribing practices. These indicators included:

Average quantity of medications prescribed during a visit.

Percentage of medications prescribed under generic names.

Percentage of cases where an antibiotic was prescribed.

Percentage of interactions with a prescribed injectable.

Percentage of medications prescribed from hospital formularies or the National List of Essential Medicines (NLEM).

Analysis of Statistics

Descriptive statistical techniques were used to assess all of the data that had been gathered once it had been entered into Microsoft Excel. While categorical variables are given as frequencies and percentages, continuous variables are shown as means. In order to assess prescribing patterns, prescription completeness, and adherence to rational prescribing principles, the results were compiled.

Result:

There were 198 males and 278 females among the 476 outpatient prescriptions that were examined. Table 1 summarizes the distribution of these prescriptions by department.

Departmental Distribution of Prescriptions

General Medicine contributed the highest proportion of prescriptions, accounting for 119 (25.0%) of the total analyzed. This was followed by Dermatology with 84 prescriptions (17.6%) and Orthopedics with 73 prescriptions (15.3%). Together, these three departments—General Medicine, Dermatology, and Orthopedics—were responsible for the majority of the total workload (58%). Other significant contributors included ENT (Ear, Nose & Throat) with 50 prescriptions (10.5%) and Surgery with 46 (9.7%). Conversely, Respiratory Medicine had the lowest representation with only 4 prescriptions (0.8%).

Table 1: Department-wise Distribution of Prescriptions

Department	No. of Prescriptions (N=476)	Percentage (%)
General Medicine	119	25.0
Dermatology	84	17.6
Orthopedics	73	15.3
ENT	50	10.5
Surgery	46	9.7
Pediatrics	35	7.4
Obstetrics & Gynaecology	24	5.0
Psychiatry	20	4.2
Dental	10	2.1
Ophthalmology	8	1.7
Respiratory Medicine	4	0.8
Total	476	100

Drug Use and WHO Prescription Indicators

The analysis of 476 prescriptions revealed that 1639 drugs were prescribed in total, resulting in an average of 3.3 drugs per prescription. This average indicates a high prevalence of polypharmacy, with 448 prescriptions (94.2%) involving the use of more than one drug, while only 28 prescriptions (5.8%) involved monotherapy (Table 2). Additional findings based on WHO prescribing parameters were as follows:

Brand Names and FDCs: Brand name prescribing was observed in 82 prescriptions (17.23%), and Fixed Dose Combinations (FDCs) were included in 92 prescriptions (19.3%).

Essential Medicines and Supplies: Compliance with hospital formulary was high, with only 37 prescriptions (7.7%) containing drugs not stocked by the hospital supply. Adherence to the National List of Essential Medicines (NLEM) was also strong, as only 52 prescriptions (11%) contained drugs not listed in the NLEM.

Antimicrobial Use: Antimicrobials were prescribed in a notable proportion of prescriptions, totaling 173 (36.3%).

Specific Drug Categories: Vitamins and Iron supplements were commonly prescribed, appearing in 171 prescriptions (36%) and constituting 10.43% of the total drugs prescribed. Injectables were rarely prescribed in the outpatient setting, found in only 5 prescriptions (1%).

Table 2: Key WHO Drug Prescription Indicators

Indicator	Total (N=476)	Percentage (%)
Average number of drug(s) per prescription	3.3	NA
Prescriptions with Polytherapy	448	94.2
Prescriptions with Antimicrobials	173	36.3
Prescriptions with Vitamins/Iron	171	36.0
Prescriptions with FDC	92	19.3
Prescriptions with brand names	82	17.23
Drugs NOT from NLEM	52	11.0
Drugs NOT from hospital supply	37	7.7
Prescriptions with Monotherapy	28	5.8
Prescriptions with Injectables	5	1.0

Omission and Completeness Parameters

A significant finding was the high rate of incomplete prescription details (Table 3). Critical information was frequently omitted: instructions for use were missing in 466 prescriptions (97.8%), follow-up information in 440 prescriptions (92.4%), diagnosis in 311 prescriptions (65%), and drug dose in 280 prescriptions (58.8%).

Despite these omissions, the legibility of prescriptions was satisfactory (419 prescriptions, 88%). However, no prescription was found to be fully complete across all documented parameters.

Table 3: Omission Parameters (Per Prescription)

Omission Indicator	Total Omissions (N)	Percentage (%)
Instructions not mentioned	466	97.8
Follow up not mentioned	440	92.4

Omission Indicator	Total Omissions (N)	Percentage (%)
Number of prescriptions without diagnosis	311	65.0
Dose not mentioned	280	58.8
Frequency not mentioned	34	7.1
Duration not mentioned	26	5.4
Formulation not mentioned	21	4.4

Adherence to Standard Treatment Guidelines (STGs)

The majority of prescriptions (370, 77.7%) adhered to Standard Treatment Guidelines (Table 4). Furthermore, prescribers demonstrated high compliance in documenting several key elements, including route of administration (98.1%), frequency (94.7%), dosage formulation (92.2%), and duration of treatment (91.0%). However, only about half of the prescriptions (242, 50.8%) mentioned the correct dose. Documentation of follow-up visits was exceptionally poor, recorded in only 30 prescriptions (6.3%). Additionally, 28 prescriptions (5.9%) were identified as containing more drugs than necessary.

Prescriber and Patient Identification

The patient's address was noted on every prescription (100% compliance). 449 prescriptions (94.32%) included the patient's mobile number. However, there was little adherence to fundamental safety precautions and prescriber identification (Table 5). The medicine names were all written in capital letters on just 4 prescriptions (0.84%). Prescriber information was noticeably lacking; only 59 prescriptions (12.39%) had a doctor's signature, and none of the 476 prescriptions included the physician's licence number.

Discussion

The current study investigated the completeness of prescription paperwork and used WHO fundamental prescribing indicators to evaluate outpatient prescribing procedures in a higher-education teaching hospital. The results highlight a number of strengths as well as areas that need development and offer insightful information about current prescribing practices.

Female patients constituted a greater proportion of the study population than males. Idris et al. reported comparable outcomes and other investigators, although some Indian studies have documented a male predominance.^{8,9} Such variations are likely attributable to differences in demographic characteristics, healthcare utilization patterns, disease profiles, and regional sociocultural factors. General Medicine accounted for the highest proportion of outpatient prescriptions, followed by Dermatology and Orthopedics. This distribution reflects the broad spectrum of illnesses managed by the General Medicine department and its role as the primary point of referral in most tertiary care hospitals.

Comparable departmental trends have been described in previous prescription audit studies conducted across India.^{10,11}

Over 94% of prescriptions had polypharmacy, and the average number of medications prescribed per contact was 3.3. Unnecessary polypharmacy raises the risk of adverse drug responses, drug interactions, medication non-adherence, and increased treatment expenditures, even if the concurrent use of numerous medications may be clinically acceptable in patients with concomitant conditions. Similar results have been reported by Batta et al., Verma et al., and other researchers, indicating that polypharmacy is still frequently prescribed in outpatient tertiary care settings.^{12,14}

Although just only a small portion of prescriptions included name-brand medications, generic prescribing was deemed satisfactory in this study. Prescribing by generic name improves affordability, enhances accessibility, and supports rational medicine use. This finding compares favourably with reports from several institutions where brand-name prescribing remains substantially higher.^{8,16} In addition, the high proportion of medicines prescribed from the hospital formulary and the National List of Essential Medicines reflects good availability of essential medicines and adherence to institutional prescribing policies. Antimicrobials were prescribed in over one-third of patient encounters, exceeding the optimal level recommended by WHO prescribing indicators. Excessive antibiotic use remains a significant contributor to antimicrobial resistance worldwide. The present findings emphasize the importance of strengthening antimicrobial stewardship programmes, encouraging evidence-based antibiotic prescribing, and conducting periodic prescription audits to monitor prescribing behaviour.¹⁷

Vitamins and iron preparations were prescribed in approximately one-third of prescriptions. Although these supplements are indicated in specific clinical situations, indiscriminate use without documented indications may increase healthcare expenditure without improving patient outcomes. Similar prescribing patterns have been reported in earlier studies evaluating micronutrient supplementation in outpatient practice.^{18,20} Regular review of prescribing practices may help ensure their rational use. One of the major observations of this study was the high frequency of incomplete prescription documentation. Patient instructions, follow-up advice, diagnosis, and drug dose were frequently omitted. Such deficiencies can adversely affect medication adherence, continuity of care, pharmacovigilance activities, and communication between healthcare professionals. Comparable shortcomings have been identified in several prescription audit studies conducted in India and other countries.^{21,22} Improving documentation practices should therefore be considered an important component of quality improvement initiatives.

Most prescriptions were considered legible, thereby reducing the likelihood of medication errors related to poor handwriting. Nevertheless, handwritten prescriptions continue to carry an inherent risk of misinterpretation. Wider implementation of standardized prescription formats or electronic prescribing systems may further improve prescription clarity and patient safety.^{23,24} More than three-quarters of prescriptions complied with Standard Treatment Guidelines, indicating generally appropriate prescribing practices within the institution. Similar adherence has been reported by previous investigators, although compliance varies considerably among healthcare settings depending on physician awareness, institutional policies, and availability of treatment protocols.^{24,25} Ongoing continuing medical education programmes and periodic feedback from prescription audits may further enhance adherence to evidence-based guidelines. The prescribed dosage form, administration method, frequency, and length of treatment were all satisfactorily documented. However, accurate recording of

drug dose was observed in only about half of the prescriptions. Since dose-related prescribing errors may result in therapeutic failure or drug toxicity, greater emphasis should be placed on complete and accurate prescription writing during undergraduate and continuing medical education.^{26, 29}

Documentation of follow-up advice was particularly poor, with only a small proportion of prescriptions containing recommendations for subsequent review. Adequate follow-up documentation is essential for monitoring therapeutic response, identifying adverse drug reactions, and improving long-term patient outcomes. Similarly, prescriber identification was incomplete in many prescriptions, with signatures and registration numbers frequently omitted. These observations are consistent with previous prescription audit reports and highlight the need for greater compliance with standard prescription writing guidelines.^{22, 30} Another noteworthy finding was the infrequent use of capital letters while writing drug names, despite recommendations aimed at minimizing look-alike and sound-alike medication errors. Adoption of electronic prescribing, standardized prescription templates, and periodic sensitization of healthcare professionals may reduce prescribing errors and improve the overall quality of prescription documentation.^{15, 30}

Overall, the findings of this study demonstrate that although prescribing practices were generally consistent with WHO recommendations regarding essential medicine use and adherence to Standard Treatment Guidelines, significant opportunities remain to improve prescription completeness and promote more rational prescribing. Antimicrobial stewardship programs, regular prescription reviews, ongoing professional education, and increased use of computerized prescribing systems are all likely to improve the security of patients and the standard of medical care..

Conclusion

Using the WHO core prescription indicators, this study offers a thorough evaluation of outpatient prescribing procedures in a higher education training hospital. Overall, prescribing practices showed a generally sensible attitude to medication use and satisfactory adherence to the National List of Essential Medicines and Standard Treatment Guidelines. Despite these positive results, a number of significant flaws were found. Essential prescription components, including as diagnosis, medication dosage, patient instructions, follow-up guidance, and physician identification, were often left out, and a significant prevalence of polypharmacy was noted. Treatment results, drug safety, continuity of care, and pharmacovigilance efforts may all be negatively impacted by such shortcomings.

The findings emphasize the need for regular prescription audits, continuous professional training on rational prescribing, and strict compliance with standard prescription writing guidelines. Strengthening antimicrobial stewardship programmes and promoting generic prescribing should also remain institutional priorities. Furthermore, implementation of standardized prescription formats or electronic prescribing systems may substantially reduce prescribing errors, improve documentation quality, and enhance patient safety.

In conclusion, periodic monitoring of prescribing practices through structured audits can serve as an effective quality improvement tool, promoting evidence-based prescribing and supporting the rational use of medicines in tertiary care healthcare settings.

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Conflict Of Interest:

The authors have no conflicts of interest regarding this investigation.

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