

STUDY OF DRUG UTILIZATION PATTERN OF ANTIBIOTICS IN OPD PATIENTS AT A TERTIARY CARE HOSPITAL: AN OBSERVATIONAL STUDY

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Received: 25th July, 2026; **Revised:** 1st August, 2026; **Accepted:** 14th August, 2026; **Available Online:** 22nd August, 2026

ABSTRACT

Background: Drug utilization studies (DUS) serve as critical tools for stakeholders to monitor prescribing patterns, optimize therapeutic regimens, and manage healthcare costs. Inappropriate and irrational antibiotic prescribing patterns contribute significantly to the emergence of global antimicrobial resistance (AMR) and increased patient healthcare expenses.

Objective: To comprehensively assess and evaluate the utilization and prescription patterns of antibiotics among patients attending the outpatient department (OPD) of a tertiary care hospital.

Methods: A prospective, cross-sectional observational study was carried out over a six-month period at a tertiary care facility. A total of 216 antibiotic-containing prescriptions were randomly sampled and analyzed using standard metrics including patient demographic features, route of administration, generic versus brand choices, mono therapy vs. combination status, and empirical versus culture-guided treatment selection.

Results: The study highlighted a higher prevalence among female patients (58.3%), with the majority falling into the young and middle-aged adult brackets, specifically the 20–30 years age group (24.5%). Most patients (98.1%) presented without clinical comorbidities. Oral administration was the primary route of choice (99.5%), and mono-therapy was standard across most encounters (91.2%). Short-course treatments lasting 5–7 days were predominantly observed. The majority of options were selected empirically (70.4%) rather than being culture-guided (29.6%), with a distinct preference toward brand-name prescribing (82.9%) over generic terms (17.1%). Broad-spectrum agents, specifically Cephalosporins and Amoxicillin-Cannulate combinations, were highly utilized.

Conclusion: Prescribing behaviors in the OPD were largely stable and rational concerning course duration and mono-therapy alignment. However, enhancing culture-based diagnostic workflows and actively shifting toward generic medicine preferences will remain crucial steps in fortifying local antimicrobial stewardship programs (ASP).

Keywords: Antibiotic utilization, drug utilization pattern, OPD, antimicrobial resistance, empirical therapy, mono-therapy.

How to cite this article: S. Kiranmai, Rathlavath Devendar, Bandirala Bhavana, Dara Apoorva, Thippani Suma. STUDY OF DRUG UTILIZATION PATTERN OF ANTIBIOTICS IN OPD PATIENTS AT A TERTIARY CARE HOSPITAL: AN OBSERVATIONAL STUDY. *Int J Drug Deliv Technol.* 2026;16(80s):149-151. DOI: 10.25258/ijddt.16.80s.16.

Source of support: Nil.

Conflict of interest: Nil.

INTRODUCTION

Drug utilization studies (DUS) serve as basic evaluative frameworks for tracking the shifting operations of modern healthcare structures. According to the World Health Organization (WHO), a drug utilization study is defined as the marketing, distribution, prescription, and subsequent ingestion of drugs within given demographic pockets, tracing their eventual medical, economic, and societal outcomes. Upholding rational drug use means patients

access therapeutic options fitting their strict clinical requirements, in specialized doses tailored to individual needs, across precise periods, and at the lowest possible economic footprint to their community.

Conversely, inappropriate management and irrational use of drugs introduce profound challenges, causing wasted resources, prolonged clinical suffering, advanced morbidity rates, and a breakdown of public trust in institutional healthcare delivery.

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Antibiotics represent a foundational and heavily prescribed component within the outpatient departments (OPDs) of modern tertiary care facilities.

Unfortunately, systemic habits including unchecked overprescribing, empirical use absent of formal laboratory confirmations, excessive reliance

on wide broad-spectrum selections, and brand-name commercial writing habits present significant public health hurdles globally. These patterns directly increase adverse drug events, prompt treatment failures, and accelerate the progression of antimicrobial resistance (AMR), which is particularly problematic in developing regions with a high infectious disease burden. Because detailed, baseline monitoring projects analyzing prescription patterns are occasionally scarce within regional tertiary OPD environments, regular prescription audits are key. This study provides formal, localized data to observe current behaviors, safeguard therapy rationality, and build actionable policies for hospital stewardship plans.

Materials And Methods

Study Design and Settings

This prospective, cross-sectional observational study was carried out inside the Outpatient Department (OPD) of a private tertiary care hospital over a continuous six-month timeframe. The protocol was submitted to and formally approved by the Institutional Ethics Committee prior to initiation.

Selection Criteria

Patients presenting to different departmental OPD clinics during the designated operational timeline were systematically evaluated for recruitment based on the following framework:

- **Inclusion Criteria:** Patients of all age groups attending the outpatient clinics who presented with a valid prescription containing at least one systemic antibiotic, showing clear legibility, and containing complete data parameters.
- **Exclusion Criteria:** Patients directly admitted to inpatient wards, emergency

Gender	Frequency (n)	Percentage (%)
Female	126	58.3
Male	90	41.7

Age-wise Distribution

The age-wise distribution showed that the 20–30 years group had the highest proportion of patients (24.5%, n=53), followed by 40–50 years (19.4%) and 30–40 years (17.6%). Children below 10 years

department encounters, repeat visits of previously logged patients during the study period, and individuals presenting with acute life-threatening medical events requiring immediate intensive care.

Data Collection And Statistical Analysis

A validated, systematic data collection form was utilized to log variables from 216 sampled patient encounters. Collected parameters included patient demographic profiles (age and gender frequency distributions), clinical baseline indicators (presence or absence of co-existing comorbidities), core prescribing characteristics (total count of concurrent antibiotics, duration of course, preferred route of administration), rational use markers (generic notation versus brand selection, and reliance on empirical judgment versus culture-and-sensitivity lab results), and distribution across distinct specialty departments.

The sample size was calculated based on an estimated enrolled base with a 95% confidence level and a 5% margin of error, yielding a final sample size of 216 prescriptions. The collected data were recorded in Microsoft Excel and analyzed using SPSS version 31.0 to generate frequencies, percentages, and mean distribution values.

Results

A total of 216 antibiotic-containing prescriptions met the strict study parameters and were fully audited.

Demographic and Clinical Baselines

Gender distribution analysis revealed a prominent representation of female outpatients (58.3%, n=126) compared to male outpatients (41.7%, n=90). The study population skewed heavily toward young and middle-aged adults, with the 20–30 years age bracket forming the largest individual cohort (24.5%, n=53).

Gender Distribution

The gender-wise distribution showed a female predominance, with females comprising 58.3% (n=126) of the study population, while males accounted for 41.7% (n=90). Overall, females were more frequently represented than males in the study group.

Gender	Frequency (n)	Percentage (%)
Total	216	100

TABLE 1: Gender wise frequency and percentage distribution.

accounted for 6.9%, while those aged 10–20 years represented 8.3%. Patients aged ≥60 years constituted 12.5%, with those ≥80 years accounting for 0.5%. Overall, nearly 77% of patients were below 50 years, indicating a

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predominance of young and middle-aged

Age Group (Years)	Frequency (n)	Percentage (%)
0–20	28	13.0
20–30	53	24.5
30–40	38	17.6
40–50	42	19.4

Comorbidity Status

The distribution of comorbidities showed that the majority of patients, 98.1% (n=212), had no comorbid conditions.

Only 1.4% (n=3) had one comorbidity, while 0.5%

Comorbidity Status	Frequency (n)	Percentage (%)
Absent	212	98.1
Present	4	1.9

Route of Administration

The route-wise distribution showed that 99.5% (n=215) of patients received antibiotics through the oral route, while only 0.5% (n=1) received injectable

Route of Administration	Frequency (n)	Percentage (%)
Oral (Tablets/Capsules/Syrups)	215	99.5
Parenteral (Injection)	1	0.5

Therapy Design

The distribution of antibiotic therapy showed that 61.1% (n=132) of patients received monotherapy, while 38.9% (n=84) received combination therapy. Overall, monotherapy

Therapy Design	Frequency (n)	Percentage (%)
Mono-therapy (Single Antibiotic)	197	91.2
Combination Therapy (≥2 Antibiotics)	19	8.8

Duration of Antibiotic Therapy

The duration of antibiotic therapy showed that 5-day treatment was most common (46.8%, n=101), followed by 7-day therapy (27.8%, n=60). About 20.4% (n=44) of

Duration	Frequency (n)	Percentage (%)
1–3 Days	25	11.6
5 Days	101	46.8
7 Days	60	27.8

Type of Prescription

Type of Prescription (Brand vs Generic)

individuals in the study population.

Age Group (Years)	Frequency (n)	Percentage (%)
50–60	31	14.3
>60	24	11.2
Total	216	100

Table 2. Age-wise Distribution

(n=1)

had more than one comorbidity. Overall, only 1.9% of the study population had at least one comorbidity, indicating a very low burden of comorbid conditions among the patients studied.

Comorbidity Status	Frequency (n)	Percentage (%)
Total	216	100

Table 3. Frequency and Percentage distribution of comorbidities

antibiotics. Overall, oral administration was overwhelmingly predominant, indicating limited use of parenteral therapy in the study population.

Route of Administration	Frequency (n)	Percentage (%)
Total	216	100

Table 4. Route of antibiotic administration among study participants.

was predominant, although combination therapy was used in a substantial proportion of patients, potentially reflecting the need for broader antimicrobial coverage or management of more complex infections.

Therapy Design	Frequency (n)	Percentage (%)
Total	216	100

Table 5. Distribution of mono-therapy and combination therapy.

patients received antibiotics for 10 days or more, while 5.1% (n=11) received 3-day therapy. Overall, 5–7 day regimens predominated, indicating a preference for short- to intermediate-duration antibiotic therapy.

Duration	Frequency (n)	Percentage (%)
>7 Days	30	13.8
Total	216	100

Table 6 Duration of antibiotic therapy among study.

The prescribing pattern showed that 82.9% (n=179) of antibiotics were prescribed by

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brand names, while only 17.1% (n=37) were prescribed by generic names. Overall, brand-name prescribing was predominant, indicating relatively

Prescription Type	Frequency (n)	Percentage (%)
Commercial Brand Name	179	82.9
Official Generic Name	37	17.1

Basis of Antibiotic Therapy

The prescribing pattern showed that 70.4% (n=152) of antibiotics were initiated empirically, while 29.6% (n=64) were prescribed based on laboratory reports.

Therapy Basis	Frequency (n)	Percentage (%)
Empirical Selection	152	70.4
Culture & Sensitivity Guided	64	29.6

Department-wise Antibiotic Distribution

The department-wise distribution showed that General Medicine accounted for the highest proportion of antibiotic prescriptions (29.6%, n=64), followed by ENT (17.1%, n=37) and Dermatology (15.3%, n=33). Urology

Department	Prescriptions (n)	Percentage (%)	Most Utilized Antibiotic Class
General Medicine	64	29.6	Amoxicillin–Clavulanate, Cephalosporins
ENT	37	17.1	Macrolides (Azithromycin), β -lactams
Dermatology	33	15.3	Tetracyclines (Doxycycline), Macrolides
Gynaecology	29	13.4	Metronidazole

Discussion

Drug utilization evaluations offer valuable insights into the baseline quality, safety, and financial compliance of clinical prescribing practices within busy outpatient networks. In this study, the widespread adoption of monotherapy (91.2%) and standard, definitive

limited use of generic prescribing in the study setting.

Prescription Type	Frequency (n)	Percentage (%)
Total	216	100

Table 7. Distribution of antibiotics prescribed by generic and brand names.

Overall, empirical antibiotic therapy was predominant, indicating greater reliance on clinical assessment than microbiological evidence for guiding antibiotic selection in the study setting.

Therapy Basis	Frequency (n)	Percentage (%)
Total	216	100

Table 8. Distribution of antibiotic prescriptions based on empirical and culturebased therapy.

contributed 13.0% (n=28), while the remaining departments accounted for smaller proportions. Overall, antibiotic prescribing was predominantly concentrated in General Medicine, ENT, and Dermatology, which together contributed approximately 62% of the prescriptions.

Department	Prescriptions (n)	Percentage (%)	Most Utilized Antibiotic Class
			Cephalosporins
Urology	28	13.0	Nitrofurantoin, Fluoroquinolones
Others	25	11.6	Fluoroquinolones (Ciprofloxacin)

Table 9. Prescribing doctors department.

treatment durations of 5–7 days align closely with international rational practice principles. Restricting concurrent exposures minimizes the expression of negative drug-drug variations, reduces the profile of toxic adverse events, and improves outpatient compliance by simplifying dosing schedules.

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However, the clear preference for commercial brand names (82.9%) presents distinct socioeconomic and clinical challenges. Prescribing via standard generic terminology avoids operational confusion during dispensing, lowers individual therapeutic expenses, and expands drug accessibility for vulnerable populations. The low rate of generic prescribing (17.1%) observed here is often driven by intensive pharmaceutical promotion, tradition, and the availability of multi-ingredient commercial fixed-dose combinations. Academic teaching centers and regional health authorities must enforce policy frameworks that incentivize or mandate generic notation to lower the economic burden on patients.

Equally significant is the high reliance on empirical therapy choices (70.4%) over definitive culture-and-sensitivity tracking. While prompt empirical administration remains critical for managing acute, highly symptomatic outpatient infections, unmonitored broad-spectrum use can hasten the selection of resistant bacterial strains. Transitioning toward a culture-supported framework is essential for protecting valuable broad-spectrum combinations (such as Amoxicillin-Clavulanate and Cephalosporins) and ensuring the long-term success of regional antimicrobial stewardship initiatives (ASP).

Conclusion

Antibiotic utilization within the outpatient department of this tertiary care facility was largely rational regarding its structural focus on monotherapy design and short-duration therapy courses. Nonetheless, important areas for improvement remain, particularly in reducing brand-name reliance and expanding the use of culture-guided diagnostic pathways. Implementing structured, regular prescription audits and promoting generic prescribing will be critical steps toward advancing rational drug use and preserving antibiotic efficacy.

Strengths And Limitations

The study highlights several important recommendations for improving antibiotic use, including strengthening antimicrobial stewardship programs (ASP) to promote rational prescribing and minimize antimicrobial resistance, encouraging culture and sensitivity testing whenever feasible to support targeted therapy, promoting generic prescribing to reduce treatment costs and improve affordability, developing and implementing department-specific standard treatment guidelines (STGs), and conducting regular prescription audits with appropriate feedback to prescribers. Patient education should also be enhanced regarding completion of antibiotic

courses and avoidance of self-medication. The use of broad-spectrum antibiotics should be restricted to appropriate clinical indications, with narrow-spectrum agents preferred whenever suitable. However, the study has certain limitations, including its conduct in a single tertiary care hospital, which may limit generalizability; the short study duration, which prevented assessment of seasonal variations; predominant reliance on empirical therapy due to limited routine culture and sensitivity testing; and evaluation of only outpatient prescriptions, with inpatient prescribing patterns not assessed. Furthermore, patient adherence, clinical outcomes, adverse drug reactions, and the cost-effectiveness of antibiotic therapy were not evaluated.

Ethical Approval

The protocol presented was authorized by the board of institutional review of GCP on 29/08/25 (Application Reference No: GCP/PD25/21).

Acknowledgement

The authors are profoundly grateful to the clinical staff, physicians, and administrative authorities of the tertiary care teaching facility for providing the vital records and supporting resources required to successfully complete this prescription audit project.

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