Student's Journal of Health Research Africa
e-ISSN: 2709-9997, p-ISSN: 3006-1059
Vol.6 No. 12 (2025): December 2025 Issue
https://doi.org/10.51168/sjhrafrica.v6i12.2340
Original Article

Drug utilization and prescription pattern study in the outpatient department of a tertiary care hospital: A cross-sectional study.

Dr. Anand Acharya[*1], Dr. Nethala Ravi Kumar[2], Dr. Bhavika.D[3]*
[1]Dean and Professor, Department of Pharmacology, Konaseema Institute of Medical Sciences, Amalapuram, Andhra Pradesh, India
[2]Associate Professor, Department of Pharmacology, Shri Shankaracharya Institute of Medical Sciences, Bhilai, Chattisgarh, India
[3]Associate Professor, Department of Pharmacology, Government Medical College and General Hospital, Quthbullapur, Telangana, India

Abstract

Background:
Drug utilization studies using WHO prescribing indicators help identify irrational prescribing and guide corrective interventions.

Objectives:
To evaluate outpatient drug utilization and prescription patterns in a tertiary care teaching hospital using WHO core prescribing indicators and to highlight key gaps affecting rational drug use.

Methods:
A hospital-based cross-sectional study was conducted in the outpatient department of a tertiary care teaching hospital. A total of 464 prescriptions were selected through systematic sampling. Data were collected using a pretested structured proforma and analyzed for WHO prescribing indicators, including average number of drugs per encounter, proportion of drugs prescribed by generic name, encounters with antibiotics and injections, use of fixed-dose combinations (FDCs), and adherence to the National Essential Medicines List (EML). Descriptive statistics were used for data analysis.

Results:
Among 464 encounters, 248 (53.4%) prescriptions were for males and 216 (46.6%) for females; the mean age was 42.8 ± 16.3 years, with most patients in the 21–40-year group (38.4%). A total of 1,322 drugs were prescribed (mean 2.85 ± 0.92 drugs/encounter). Generic prescribing was 47.2% (624/1,322), and EML adherence was 77.3% (1,022/1,322). Antibiotics were prescribed in 30.6% of encounters (142/464), while injections were used in 8.2% (38/464). FDCs were present in 27.5% of prescriptions (128/464). Among antibiotics (n = 188), cephalosporins were predominant (58/188; 30.8%), followed by fluoroquinolones (42/188; 22.3%). Gaps indicating irrational use included higher-than-ideal drug count per prescription, suboptimal generic prescribing, frequent FDC use, and incomplete diagnosis/clinical notes in 17.3% of prescriptions.

Conclusion:
OPD prescribing showed low injection use and moderate EML adherence, but persistent gaps in polypharmacy tendency, generic prescribing, antibiotic exposure, and FDC use remain.

Recommendations:
Regular prescription audits, strengthening antimicrobial stewardship, continuous prescriber education, promotion of generic prescribing, and periodic revision of hospital formularies are essential to enhance rational drug use in outpatient settings.

Keywords: *Drug utilization; Prescription pattern; WHO prescribing indicators; Antibiotics; Generic prescribing; Essential Medicines List; Outpatient department.*
Submitted: *August 22, 2025* ***Accepted:*** *October 28, 2025* ***Published:*** *December 31, 2025*

Corresponding author: *Anand Acharya.*
Email: ***anand_kims@yahoo.co.in.***
Dean and Professor, Department of Pharmacology, Konaseema Institute of Medical Sciences, Amalapuram, Andhra Pradesh, India.

Student's Journal of Health Research Africa
e-ISSN: 2709-9997, p-ISSN: 3006-1059
Vol.6 No. 12 (2025): December 2025 Issue
https://doi.org/10.51168/sjhrafrica.v6i12.2340
Original Article

Introduction

Rational prescribing is a cornerstone of high-quality medical care and is vital for ensuring that medicines are used safely, effectively, and cost-efficiently across both inpatient and outpatient settings. Drug utilization research, as conceptualized by the World Health Organization, examines the marketing, distribution, prescribing, and consumption of medicines, with particular focus on their medical, social, and economic implications [1]. Such evaluations offer a realistic picture of prevailing prescribing practices, facilitate the detection of irrational drug use, and provide a scientific basis for corrective strategies within health-care systems.

Despite global efforts, irrational drug use continues to pose a major challenge. Practices such as polypharmacy, excessive and inappropriate antibiotic prescribing, unnecessary use of injections, and poor adherence to standard treatment guidelines are widely reported across diverse health-care settings [2,3]. To address these issues, the WHO has proposed a set of core drug-use indicators that serve as standardized tools for assessing prescribing quality and promoting rational pharmacotherapy [4]. In India, these concerns are further intensified by heavy patient loads, limited consultation time, easy over-the-counter availability of medicines, variability in prescriber training, and the influence of pharmaceutical marketing [5].

Tertiary care hospitals occupy a strategic position in shaping prescribing behaviour, as they cater to heterogeneous patient populations and function as major referral centres. Systematic evaluation of outpatient prescribing patterns in such institutions yields actionable evidence for clinicians, hospital administrators, and policymakers. It also supports rational drug-use policies, strengthens antimicrobial stewardship initiatives, and encourages adherence to national essential medicines lists [6,7]. Beyond quantifying drug consumption, drug utilization studies help assess conformity with treatment guidelines, evaluate the use of fixed-dose combinations, and identify overuse or misuse of specific therapeutic classes [8].

In this context, the present study was undertaken in the Department of Pharmacology at Konaseema Institute of Medical Sciences, Amalapuram, Andhra Pradesh, India, to comprehensively evaluate drug utilization and prescribing patterns in the outpatient department, with the overarching aim of improving prescribing quality and patient outcomes. Specifically, the study sought to analyze prescribing practices using World Health Organization core prescribing indicators; to assess the utilization patterns of various pharmacological classes of medications prescribed in the outpatient setting; and to determine the extent of polypharmacy, the proportion of drugs prescribed by generic name, and adherence to the Essential Medicines List. In addition, the study aimed to evaluate the prescribing patterns of antibiotics, analgesics, and fixed-dose combinations, and to identify existing gaps in rational drug use, thereby enabling the formulation of appropriate corrective and educational interventions.

Materials and Methods

Study Design and Setting

This cross-sectional, observational drug utilization and prescription pattern study was conducted in the Outpatient Department (OPD) under the Department of Pharmacology at Konaseema Institute of Medical Sciences, Amalapuram, Andhra Pradesh, India. The study was carried out over a six-month period from January 1, 2025, to June 30, 2025.

KIMS&RF serves as a major referral center for the Konaseema region and surrounding rural and semi-urban areas of East Godavari district, catering to a diverse catchment population characterized by mixed socioeconomic and educational backgrounds. A substantial proportion of patients belong to agrarian and coastal communities, with varying access to primary healthcare facilities. The outpatient department experiences a high daily patient turnover, providing a representative spectrum of acute and chronic medical conditions.

Study Population

The study population comprised prescriptions issued to patients attending selected outpatient clinics during the study period. Both new and follow-up patient encounters were included.

Inclusion Criteria

Prescriptions were issued to patients attending the OPD during the study period.

Prescriptions containing legible information on drug name, dose, frequency, and duration.

Exclusion Criteria

Incomplete or illegible prescriptions.

Prescriptions pertaining to inpatients, emergency department visits, or prescriptions issued outside the study OPD.

Sample Size Calculation

The sample size was calculated using the standard formula for estimating a single proportion:

$n = Z^2 \times p\,(1 - p) / d^2$

Where Z = 1.96 (95% confidence level), p = 0.5 (anticipated proportion), and d = 0.05 (absolute precision).

The calculated minimum sample size was 385 prescriptions. After adjusting for a 10% non-response or

Student's Journal of Health Research Africa
e-ISSN: 2709-9997, p-ISSN: 3006-1059
Vol.6 No. 12 (2025): December 2025 Issue
https://doi.org/10.51168/sjhrafrica.v6i12.2340
Original Article

incomplete prescription rate, the final required sample size was 424 prescriptions.

Sampling Technique

Systematic random sampling was employed to select OPD prescriptions until the desired sample size was achieved.

Data Collection

Data were collected by trained interns and residents using a pretested structured proforma. Information recorded included patient demographics, diagnosis, number of drugs per prescription, drug names (generic/brand), dosage form, dose, frequency, duration, antibiotic use, injection use, fixed-dose combinations, and adherence to the National Essential Medicines List (EML). Data accuracy and completeness were verified by a senior investigator.

Variables

Outcomes were WHO prescribing indicators: mean drugs/encounter, % drugs by generic name, % encounters with antibiotics, % encounters with injections, and % drugs from National EML. Secondary outcomes included % prescriptions containing ≥1 FDC, distribution of drug classes, antibiotic class profile, and prescription completeness (patient identifiers, diagnosis/notes, dose–frequency–duration, prescriber signature). Exposures/predictors were age (and age groups), sex, and visit type (new/follow-up). Potential confounding by diagnosis/case-mix was considered where recorded. Effect modification was assessed descriptively across age groups and visit type. Polypharmacy was defined as ≥5 drugs/prescription.

Operational Definitions

WHO core prescribing indicators were used. Polypharmacy was defined as prescriptions containing five or more drugs.

Bias

Selection bias was reduced by systematic random sampling of OPD prescriptions across the study period with predefined inclusion/exclusion criteria. Information bias was minimized using a pretested proforma, trained data collectors, and senior verification of extracted data; 10% records underwent double data entry to limit transcription errors. Misclassification of drug classes and FDCs was controlled by checking drug names/compositions and applying consistent pharmacological classification. Confounding by clinical diagnosis was addressed by capturing diagnosis/clinical notes when available and interpreting indicator results in light of documentation completeness. The use of objective WHO indicators limited observer subjectivity.

Data Management and Statistical Analysis

Data were entered into Microsoft Excel and analyzed using SPSS version 25. Descriptive statistics were used, with categorical variables expressed as frequencies and percentages, and continuous variables as mean ± standard deviation. Appropriate inferential tests were applied, with $p < 0.05$ considered statistically significant.

Quality Control

The data collection proforma was pretested on 30 prescriptions. Data collectors were trained prior to study initiation, and 10% of records underwent double data entry for quality assurance.

Ethical Considerations

Ethical approval was obtained from the Institutional Ethics Committee of Konaseema Institute of Medical Sciences. Patient confidentiality was maintained through anonymization, and no personal identifiers were disclosed.

Results

Participants

During the six-month study period (January 1, 2025, to June 30, 2025), all outpatient prescriptions issued in the selected clinics were screened for eligibility. A total of 512 prescriptions were initially identified as potentially eligible. Of these, 26 prescriptions were excluded due to incomplete documentation (missing drug details or unclear duration), and 22 prescriptions were excluded because of illegibility or ambiguity in drug names/dosage instructions.

After applying inclusion and exclusion criteria, 464 prescriptions were confirmed eligible and included in the final analysis. There were no refusals, as the study was prescription-based and did not involve direct patient participation. Thus, the final analytical sample comprised 464 outpatient encounters.

Student's Journal of Health Research Africa
e-ISSN: 2709-9997, p-ISSN: 3006-1059
Vol.6 No. 12 (2025): December 2025 Issue
https://doi.org/10.51168/sjhrafrica.v6i12.2340
Original Article

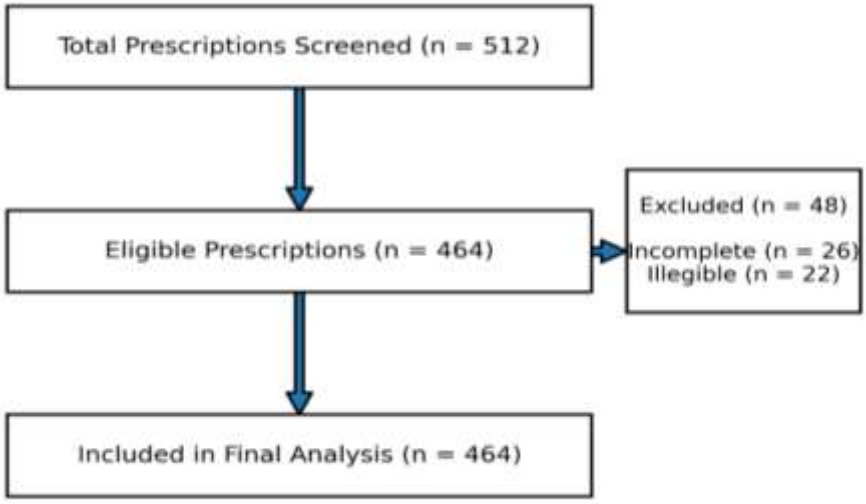

Figure 1: Participant Flow Diagram

A total of 464 outpatient prescriptions were analyzed after applying the inclusion and exclusion criteria. Baseline Characteristics of Patients: Of the 464 patients whose prescriptions were reviewed, 248 (53.4%) were male, and 216 (46.6%) were female. The mean age was 42.8 ± 16.3 years, with the majority belonging to the 21–40 years age group.

Table 1:- Baseline Characteristics of Patients (n = 464)

Variable	Frequency	Percentage (%)
Gender		
Male	248	53.4
Female	216	46.6
Age Group (years)		
<20	56	12.1
21–40	178	38.4
41–60	152	32.8
>60	78	16.8
Type of Visit		
New	302	65.1
Follow-up	162	34.9

WHO Core Prescribing Indicators

Average Number of Drugs per Prescription

A total of 1,322 drugs were prescribed across 464 encounters, giving: Average drugs per encounter=1322/464=2.85. The average number of drugs per prescription was 2.85 ± 0.92.

Percentage of Drugs Prescribed by Generic Name: - Out of 1,322 prescribed drugs, 624 (47.2%) were written by generic name. Percentage of Encounters with an Antibiotic Prescribed: - Antibiotics were prescribed in 142 prescriptions: 142/464×100=30.6%

Percentage of Encounters with an Injection Prescribed: Injections were prescribed in 38 prescriptions:38 /464 × 100 = 8.2 %. Percentage of Drugs Prescribed from the Essential Medicines List (EML): A total of 1,022 drugs (77.3%) were from the National Essential Medicines List.

Therapeutic Class Distribution

Table 2. Drug Class Distribution (n = 1,322 drugs)

Drug Class	Number	% of Total Drugs
Antibiotics	188	14.2
Analgesics & NSAIDs	254	19.2
Gastrointestinal drugs	188	14.2

Student's Journal of Health Research Africa
e-ISSN: 2709-9997, p-ISSN: 3006-1059
Vol.6 No. 12 (2025): December 2025 Issue
https://doi.org/10.51168/sjhrafrica.v6i12.2340
Original Article

Antihypertensives	166	12.6
Antidiabetics	124	9.4
Vitamins & Supplements	225	17.0
Others	177	13.4

Antibiotic Utilization Pattern

Table 3: Among the 188 antibiotics prescribed:

Antibiotic Class	Number (%)
Cephalosporins	58 (30.8%)
Fluoroquinolones	42 (22.3%)
Penicillins	36 (19.1%)
Macrolides	28 (14.9%)
Others	24 (12.7%)

Most commonly prescribed individual antibiotics:

Cefixime (18.6%) Ciprofloxacin (12.8%) Azithromycin (10.1%)

Fixed-Dose Combinations (FDCs)

A total of 128 FDCs were prescribed (27.5% of all prescriptions contained at least one FDC).
Common FDC groups: Analgesic-NSAID combinations (38%), Antihistamine-cough formulations (22%), Antidiabetic FDCs (16%), PPI + prokinetic combinations (12%)

Table 3 Prescription Completeness

Parameter	Complete (%)
Doctor's name & signature	100%
Patient name/age/sex	96.3%
Diagnosis/clinical notes	82.7%
Dose, frequency, duration	91.5%

DISCUSSION

The present study analyzed 464 outpatient prescriptions to assess the patterns of drug utilization and rational prescribing practices in a tertiary care hospital. The findings provide insight into current prescribing behaviour and identify key areas requiring intervention.
The average number of drugs per prescription was 2.85, which is slightly higher than the WHO-recommended ideal range of 1.6 to 1.8 (9). Similar findings were reported in other Indian studies, where the average ranged from 2.4 to 3.5 drugs per encounter (10,11). A higher mean value in our study suggests the presence of polypharmacy, possibly influenced by patient expectations, symptom-based prescribing, and lack of strict adherence to standard treatment guidelines.
The proportion of drugs prescribed by generic name (47.2%) was lower than the WHO expectation of 100% (9). Although increasing generic prescribing is a national priority under Jan Aushadhi and NMC guidelines, several studies across India similarly report suboptimal adherence to generic prescription practices (12,13). This indicates the need for educational interventions and administrative reinforcement.
The percentage of encounters with an antibiotic prescription (30.6%) is within the upper limit of WHO's acceptable range (20–30%) (9), though slightly on the higher side. Comparable Indian studies report antibiotic use between 28–42% (10,14). Over-prescription of antibiotics is concerning, as it fuels antimicrobial resistance—now a growing global health threat (15). The predominant use of cephalosporins and fluoroquinolones is consistent with prescribing trends in similar tertiary care OPD settings (16).
Only 8.2% of prescriptions contained injections, which aligns well with the WHO acceptable range (13.4–24.1%) (9). Lower injection use indicates more rational practice and reduced risk of injection-related infections.
The use of drugs from the National Essential Medicines List (77.3%) was satisfactory but still below the optimal 100%. Many studies report even lower EML adherence in outpatient settings, often between 45–70% (11,12). Improving prescriber awareness and ensuring hospital formulary alignment with the EML can further enhance rational prescribing.
A notable finding was the high use of fixed-dose combinations (27.5%), many of which are irrational or not approved by WHO. Similar concerns are highlighted across Indian literature, where irrational FDCs contribute to polypharmacy and increase the risk of adverse drug reactions (10,16).

Student's Journal of Health Research Africa
e-ISSN: 2709-9997, p-ISSN: 3006-1059
Vol.6 No. 12 (2025): December 2025 Issue
https://doi.org/10.51168/sjhrafrica.v6i12.2340
Original Article

Generalizability of the Findings

The findings of this study offer meaningful insights into outpatient prescribing practices in tertiary care teaching hospitals, particularly within similar resource-constrained health-care settings in India. Given the use of standardized WHO core prescribing indicators, systematic sampling, and inclusion of a large number of outpatient encounters, the results are likely to be applicable to other tertiary care institutions with comparable patient loads, prescriber profiles, and drug procurement systems. However, variations in institutional policies, availability of medicines, local antimicrobial resistance patterns, and prescriber training may influence prescribing behaviour across different regions. Therefore, while the overall trends related to polypharmacy, generic prescribing, antibiotic use, and fixed-dose combinations are broadly generalizable, institution-specific audits remain essential. Replication of such studies across multiple centres would further strengthen external validity and support national-level policy formulation aimed at promoting rational drug use.

Conclusion

This study provides a valuable overview of prescribing practices in the outpatient department of a tertiary care hospital. Favorable findings, such as low reliance on injectable formulations and satisfactory adherence to the Essential Medicines List, indicate a reasonable level of rational prescribing. Nevertheless, the relatively high average number of drugs per prescription, suboptimal use of generic names, and frequent prescribing of antibiotics and fixed-dose combinations highlight areas requiring attention. Strengthening antimicrobial stewardship initiatives, encouraging generic prescribing, and ensuring strict adherence to Standard Treatment Guidelines are imperative. In addition, regular prescription audits, targeted prescriber education, and supportive institutional policies can promote more rational drug use, reduce unnecessary medication exposure, and ultimately improve patient safety and clinical outcomes.

Limitations

This study has limitations that require cautious interpretation. As a single-center study conducted in a tertiary care hospital, the findings do not fully reflect prescribing practices in other settings or regions, where protocols, patient profiles, prescriber training, and drug availability differ. The cross-sectional design captures prescribing patterns at one point in time and does not incorporate seasonal changes in morbidity or antibiotic use. Because the assessment relied only on written prescriptions, actual drug intake, adherence, adverse outcomes, and treatment response were not evaluated. Clinical appropriateness in relation to recorded diagnoses was not systematically judged. Pharmacoeconomic analysis was not performed, leaving cost implications unassessed.

Recommendations

To promote rational drug use in outpatient settings, regular prescription audits using WHO prescribing indicators should be institutionalized. Continuous medical education programs must emphasize generic prescribing, rational antibiotic use, and adherence to Standard Treatment Guidelines and the Essential Medicines List. Strengthening antimicrobial stewardship initiatives, particularly in monitoring antibiotic selection and duration, is essential to curb emerging resistance. Hospital formularies should be periodically reviewed to eliminate irrational fixed-dose combinations and align with national guidelines. Additionally, integrating clinical pharmacists into outpatient care, using electronic prescribing systems, and providing prescriber feedback can further improve prescription quality, reduce polypharmacy, and enhance patient safety and therapeutic outcomes.

Acknowledgements

The authors express their sincere gratitude to the faculty and staff of the Department of Pharmacology, Konaseema Institute of Medical Sciences, Amalapuram, for their constant support and cooperation during the conduct of this study. We also acknowledge the contributions of the interns and postgraduate residents involved in data collection and verification. Our appreciation extends to the hospital administration for granting permission to conduct the study and to the Institutional Ethics Committee for ethical guidance and approval.

Abbreviations

AMR –Antimicrobial Resistance
EML – Essential Medicines List
FDC – Fixed-Dose Combination
IEC – Institutional Ethics Committee
OPD – Outpatient Department
SD – Standard Deviation
STG – Standard Treatment Guidelines
WHO – World Health Organization

Source of funding

The study had no funding.

Conflict of interest

The authors declare no conflict of interest.

Author contributions

AA-Concept and design of the study, results interpretation, review of literature, and preparing the first

Student's Journal of Health Research Africa
e-ISSN: 2709-9997, p-ISSN: 3006-1059
Vol.6 No. 12 (2025): December 2025 Issue
https://doi.org/10.51168/sjhrafrica.v6i12.2340
Original Article

draft of the manuscript. Statistical analysis and interpretation, revision of manuscript.**NRK**-Concept and design of the study, results interpretation, review of literature, preparing the first draft of the manuscript, and revision of the manuscript.**BD**-Review of literature and preparing the first draft of the manuscript. Statistical analysis and interpretation.

Data availability

Data available on request

Author Biography

Dr. Anand Acharya, MBBS, MD (Pharmacology), currently serves as Dean and Professor, Department of Pharmacology, at the Konaseema Institute of Medical Sciences & Research Foundation (KIMS&RF), Amalapuram, Andhra Pradesh, India. A distinguished academician, researcher, and medical education leader, he has been pivotal in transforming KIMS&RF from its formative phase into a premier medical institution with over 200 undergraduate and 100 postgraduate seats.

With more than 18 years of teaching and administrative experience, Dr. Acharya has held several leadership positions, including Vice Principal, Principal, Chief Warden, Member Secretary of Institutional Ethics and Animal Ethics Committees, and is an approved PhD Guide under Dr. NTR University of Health Sciences, Vijayawada. His visionary leadership has significantly enhanced the institution's academic quality, clinical exposure, research infrastructure, and postgraduate training standards.

He has completed prestigious national faculty development programs such as the Revised Basic Course Workshop (rBCW), Advanced Course in Medical Education (ACME), and National Teacher Training Course (NTTC, JIPMER, Puducherry). He also serves as Coordinator for Pharmacovigilance and Materiovigilance Programs under IPC–PvPI and MoHFW, Government of India, contributing actively to national drug safety and regulatory initiatives.

A prolific academician, Dr. Acharya has authored and co-authored more than 100 scientific publications in reputed national and international indexed journals. His wide-ranging research covers toxicology, pharmacovigilance, antimicrobial resistance, endocrinology, neuropharmacology, and clinical pharmacology. His recent studies include long-term analyses of pyrethroid, paraquat, and chlorpyrifos poisoning, investigations into antimicrobial resistance trends, and predictive models for treatment outcomes in dermatological and toxicological emergencies.

Dr. Acharya's professional interests include clinical pharmacology, toxicovigilance, rational drug use, pharmacovigilance systems, and innovations in medical education technologies. He continues to mentor numerous postgraduate and undergraduate researchers while playing an integral role in curriculum reform, ethics governance, and institutional academic advancement.**ORCID iD**: https://orcid.org/0009-0000-7967-9092

Dr. Nethala Ravi Kumar, PhD (Medical Pharmacology), is an Associate Professor in the Department of Pharmacology at Shri Shankaracharya Institute of Medical Sciences, Bhilai, Chhattisgarh, India. He holds a PhD in Medical Pharmacology, with academic and research interests focused on drug safety evaluation, experimental pharmacology, and the translation of pharmacological evidence into clinical practice. He is actively involved in teaching pharmacology to undergraduate and postgraduate medical students, guiding research projects, and strengthening departmental academic activities. His work reflects a commitment to advancing rational therapeutics and fostering high-quality medical education. **ORCID iD: https://orcid.org/0000-0002-9231-6947**

Dr.Bhavika D, MBBS, MD (Pharmacology), is currently serving as Associate Professor in the Department of Pharmacology, Government Medical College Quthbullapur. She worked as Assistant Professor at SVS Medical College, Mahbubnagar for a period of 1 year, She also worked as Assistant Professor at Kamineni Academy of Medical Sciences & Research centre for a period of 3 years then she joined as Assistant Professor at Government Medical College Nalgonda and served there for 5 years after which she was promoted to Associate Professor at Government Medical College Quthbullapur. She has guided Undergraduate and Postgraduate students in research work and thesis work. She has a teaching experience of 11 years and has authored 11 publications in reputed journals focusing on Pharmacology. **ORCID iD**: https://orcid.org/0000-0001-8921-1557

References

1. Bachhav SS, Kshirsagar NA. Systematic review of drug utilization studies & the use of the drug classification system in the WHO-SEARO Region. Indian J Med Res. 2015 Aug;142(2):120-9. doi: 10.4103/0971-5916.164223. PMID: 26354209; PMCID: PMC4613433.
2. The rational use of drugs and WHO. Dev Dialogue. 1985;(2):1-4. PMID: 12341043.
3. Ofori-Asenso R, Brhlikova P, Pollock AM. Prescribing indicators at primary health care centers within the WHO African region. BMC Public Health. 2016;16:724.
4. World Health Organization. How to Investigate Drug Use in Health Facilities: Selected Drug Use Indicators. WHO, 1993.
5. Biswas NR, Biswas RS, Pal PS, Jain SK, Malhotra SP, Gupta A, Pal SN. Patterns of prescriptions and drug use in two tertiary hospitals in Delhi. Indian J Physiol Pharmacol. 2000 Jan;44(1):109-12. PMID: 10919106.

Student's Journal of Health Research Africa
e-ISSN: 2709-9997, p-ISSN: 3006-1059
Vol.6 No. 12 (2025): December 2025 Issue
https://doi.org/10.51168/sjhrafrica.v6i12.2340
Original Article

6. Karande S, Sankhe P, Kulkarni M. Patterns of prescription and drug dispensing. Indian J Pediatr. 2005 Feb;72(2):117-21. doi: 10.1007/BF02760693. PMID: 15758532.
7. Srinivasa J, Swamy S. Analysis of prescriptions for completeness in a tertiary care teaching hospital. Int J Basic Clin Pharmacol. 2020;9(12):1849-53. doi:10.18203/2319-2003.ijbcp20204956.
8. Kaur S, Rajagopalan S, Kaur N, Shafiq N, Bhalla A, Pandhi P, Malhotra S. Drug utilization study in medical emergency unit of a tertiary care hospital in north India. Emerg Med Int. 2014;2014:973578. doi: 10.1155/2014/973578. Epub 2014 May 5. PMID: 24883208; PMCID: PMC4026969.
9. Sisay M, Mengistu G, Molla B, Amare F, Gabriel T. Evaluation of rational drug use based on World Health Organization core drug use indicators in selected public hospitals of eastern Ethiopia: a cross-sectional study. BMC Health Serv Res. 2017 Feb 23;17(1):161. doi: 10.1186/s12913-017-2097-3. PMID: 28231833; PMCID: PMC5324210.
10. Mittal N, Mittal R, Singh I, Shafiq N, Malhotra S. Drug utilisation study in a tertiary care center: recommendations for improving hospital drug dispensing policies. Indian J Pharm Sci. 2014 Jul;76(4):308-14. PMID: 25284928; PMCID: PMC4171867.
11. Shanmugapriya S, Saravanan T, Rajee SS, Venkatrajan R, Thomas PM. Drug prescription pattern of outpatients in a tertiary care teaching hospital in Tamil Nadu. Perspect Clin Res. 2018 Jul-Sep;9(3):133-138. doi: 10.4103/picr.PICR_86_17. PMID: 30090712; PMCID: PMC6058512.
12. Shrestha JTM, Tiwari S, Kushwaha DK, Bhattarai P, Shrestha R. Drug Prescription in the Department of Medicine of a Tertiary Care Hospital according to the World Health Organization/International Network for Rational Use of Drugs Core Indicators: A Descriptive Cross-sectional Survey. JNMA J Nepal Med Assoc. 2021 Aug 12;59(240):745-748. doi: 10.31729/jnma.5612. PMID: 34508487; PMCID: PMC9107841.
13. Aldabagh A, Abu Farha R, Karout S, Itani R, Abu Hammour K, Alefishat E. Evaluation of Drug Use Pattern in Pediatric Outpatient Clinics in a Tertiary Teaching Hospital Using WHO Drug-Prescribing Indicators. J Multidiscip Healthc. 2022 May 18;15:1143-1151. doi: 10.2147/JMDH.S362172. PMID: 35611000; PMCID: PMC9124472.
14. Ogaji DS, Nwaejike D, Ebiekuraju O. Quality of Drug Prescribing and Dispensing Practices in Primary Healthcare Centres in an Urban Local Government Area in Nigeria. West Afr J Med. 2023 Sep 28;40(9):925-934. PMID: 37767782.
15. Laxminarayan R, Matsoso P, Pant S, Brower C, Røttingen JA, Klugman K, Davies S. Access to effective antimicrobials: a worldwide challenge. Lancet. 2016 Jan 9;387(10014):168-75. doi: 10.1016/S0140-6736(15)00474-2. Epub 2015 Nov 18. PMID: 26603918.
16. Gautam CS, Saha L. Fixed dose drug combinations (FDCs): rational or irrational: a viewpoint. Br J Clin Pharmacol. 2008 May;65(5):795-6. doi: 10.1111/j.1365-2125.2007.03089.x. Epub 2008 Feb 21. PMID: 18294326; PMCID: PMC2432494.

PUBLISHER DETAILS

Student's Journal of Health Research (SJHR)
(ISSN 2709-9997) Online
(ISSN 3006-1059) Print
Category: Non-Governmental & Non-profit Organization
Email: studentsjournal2020@gmail.com
WhatsApp: +256 775 434 261
Location: Scholar's Summit Nakigalala, P. O. Box 701432, Entebbe Uganda, East Africa