



Evaluation of Drug Utilization Pattern Among Adult Patients in A District Headquarters Government Hospital Using World Health Organization Indicators

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ABSTRACT

Objective: Rational prescription practices are crucial for effective healthcare delivery. Rational drug delivery systems (RDDS) are designed to improve the efficacy and safety of therapeutic agents by controlling the rate, time, and place of drug release. Evaluating prescriptions is a critical component of healthcare that ensures the safety, efficacy, and appropriateness of medication use. This process involves a systematic review of prescriptions to identify and prevent potential drug-related problems, such as drug interactions, contraindications, incorrect dosages, and patient non-adherence.

Methods: A cross-sectional analysis was conducted in a tertiary care hospital. This study evaluates the prescription patterns in adult patients, focusing on antibiotics, injectables, disease prevalence, polypharmacy, and consultation time.

Result: Examining 317 prescriptions over six months. Antibiotics were prescribed in 60% of cases, with injectables constituting 48%. Respiratory and gastrointestinal diseases were the most prevalent. Polypharmacy, defined as the use of five or more medications, was observed in 81% of patients. The average consultation time was 8 minutes, highlighting potential issues with patient-doctor interaction quality.

Conclusion: The findings underscore the need for stricter guidelines on antibiotic use, careful management of polypharmacy, and improved consultation practices to enhance patient outcomes.

Keywords: Rational use, Antibiotics, Injectables, Disease prevalence, Polypharmacy and Consultation time.

INTRODUCTION

The World Health Organization (WHO) defines drug use studies as the promotion, distribution, prescription, and use of medications within a community, with a focus on the resulting effects on health, society, and the economy¹. Educating general populations with correct medication use is the primary goal of drug utilization studies, including patients². Overprescribing medications can lead to adverse drug events, drug-drug interactions, and polypharmacy problems³. Therefore, our study aims to evaluate various challenges by employing WHO prescribing indicators⁴. These prescribing indicators are used to assess how effectively healthcare professionals perform in a number of crucial areas about the responsible use of medications.

The World Health Organization (WHO) recommends prescribing indicators to improve the quality of performance when it comes to writing prescriptions that are appropriate for each patient's needs⁵. The authorized, systematic, continuing examination of doctor prescriptions, pharmacist dispensing, and patient medication use is known as drug use evaluation. Drug use evaluation is a continuous, comprehensive procedure meant to preserve responsible and efficient drug use⁶. Specifically, markers including prescription drug utilization, generic drug usage, injectable drug use, and antibiotic use may be influencing other clinical parameters. However, in order to improve the

sensible use of pharmaceuticals, this study has to be developed in a number of areas. Rational drug delivery systems (RDDS) regulate the rate, duration, and location of drug release to increase the therapeutic agent's efficacy and safety. One of the most important aspects of healthcare is prescription evaluation, which assures the suitability, safety, and effectiveness of medication. In order to find and stop possible drug-related issues such as drug interactions, contraindications, wrong dosages, and patient non-adherence, this procedure entails a thorough examination of prescriptions. Adult patients receiving a fixed dosage may experience a variety of alterations and issues, such as fluctuations in body composition and weight, variations in metabolism, Comorbid conditions: Changes in pharmacokinetics and pharmacodynamics may occur in patients with several comorbid conditions. Patient-specific characteristics, narrow therapeutic index, and complex interactions between various diseases and treatments may not be taken into account by a fixed dose.

METHODS

Study Design:

In Virudhunagar, Tamil Nadu, a tertiary care hospital performed a cross-sectional analysis. In order to assess the prescription patterns of adult patients, this study looks at factors such as consultation time, polypharmacy, disease prevalence, injectables, and antibiotics. The six-month



evaluation was carried out. During the mentioned duration, information gathered from patient case sheets from several departments of the tertiary care hospital was appropriately documented.

Data Collection:

The information gathered from the case sheets covers the patients' age, gender, and socioeconomic position in addition to their provisional and final diagnoses, blood parameters, serum creatinine, urea, and hemoglobin levels, dosage, frequency, and other prescription medication information. The samples were gathered using a procedure known as systematic random sampling.

Inclusion and Exclusion Criteria:

Patients from several departments, including general medicine, surgery, psychiatry, fever, post-operative care, emergency, and ophthalmology, who were between the ages of 19 and 59 and of both genders, were randomly selected to be part of the study. Other patients were not included in our study, and no ambulatory geriatric patients were included.

The study excluded individuals with severe illnesses requiring ICU admissions as well as those who were unable to communicate. Twice a week, all of the chosen inpatients received visits in the wards where they were admitted throughout their hospital stay. Every patient who took part in the trial was monitored until their release, and data was collected by looking over and documenting their case records.

Prescribing Indicators Measurement:

Prescription indicators provided by the WHO include the average amount of medications prescribed, the average number of antibiotics prescribed, the percentage of medications prescribed under generic names, and the percentage of medications prescribed as injections that were checked. The WHO's prescription indication manual formulae were used to conduct the experiments⁷.

Patient care Indicators Measurement:

Indicators of patient care include average consultation and dispensing times, the proportion of medications that are actually delivered, and patients' awareness of appropriate dosage⁸. The average amount of time doctors spent consulting in an inpatient setting was one of these tests. Three categories were used to categorize the consultation time: less than 5 minutes, five to 10 minutes, and more than 10 minutes. Improved healthcare results have been associated with longer consultation times.

Health Facility Indicators Measurement:

It is a test of a physician's capacity to prescribe medication rationally⁹. The compliance of prescribed (key) medicines was compared and examined with the WHO's essential prescription list or formulary. The main medications chosen were retinol, tetracycline eye ointment, iodine, cotrimoxazole tablets, procaine penicillin injection, pediatric paracetamol tablets, chloroquine tablets, ferrous

sulfate + folic acid tablets, mebendazole tablets, tetracycline eye ointment, and benzoic acid + salicylic acid ointment¹⁰. In order to assess drug availability, these key medications were chosen in accordance with the WHO's model list of key medications¹¹.

Data Analysis:

All of the data sources were separated and gathered from inpatient case sheets of medical facilities. Excel 2010 was then used to analyze the data. The averages and percentage of the observed values of the indicators were provided. In 317 case sheets, about 317 prescriptions were examined.

RESULTS

Out of 317 adult patients, 174 were male (55%) and 143 were female (45%). Majority of the patients (89) were between the age group 50 - 59. That accounts for 30%. This is represented in the Table 1 and graph is mentioned in fig.1 and fig.2.

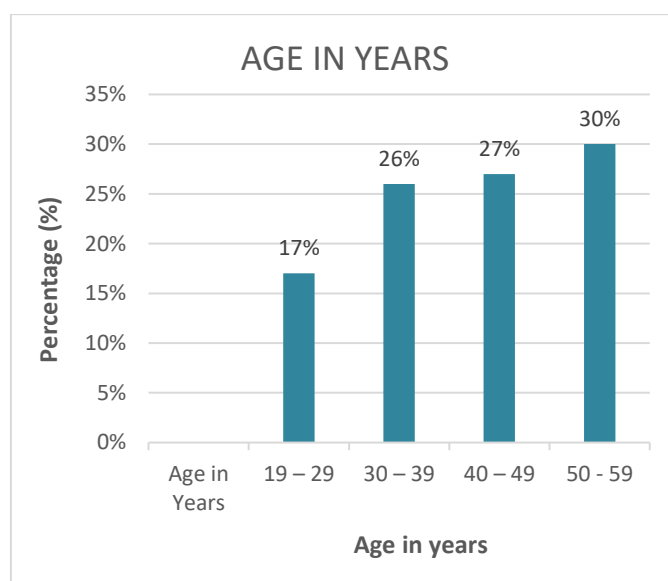


Figure 1: Socio Demographic Details of Study Population.

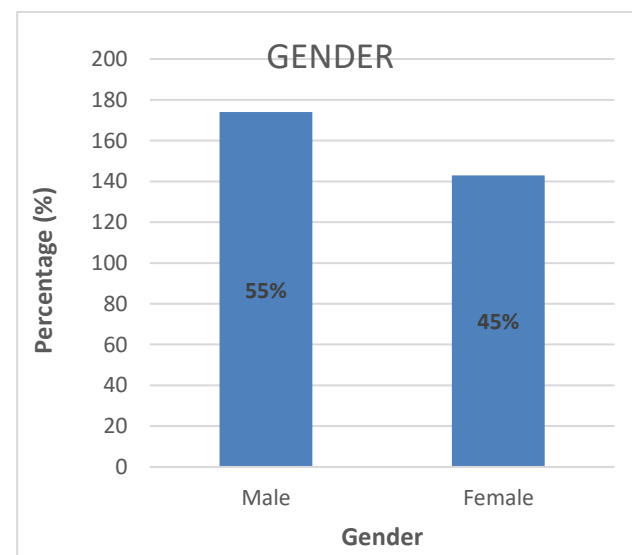


Figure 2: Socio Demographic Details of Study Population.

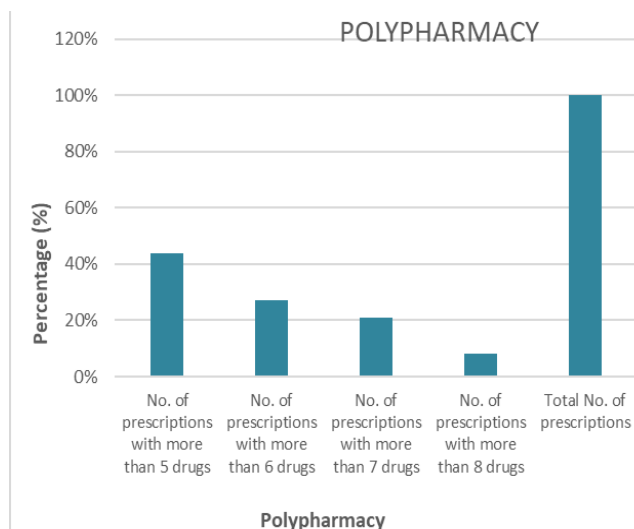
Table 1: Socio Demographic Details of Study Population.

Indicators	Frequency (N)	Percentage (%)
Age in Years		
19 – 29	54	17%
30 – 39	85	26%
40 – 49	87	27%
50 - 59	89	30%
Gender	Frequency	Percentage
Male	174	55%
Female	143	45%

As far as the prescription indicators are considered the average number of drugs per prescription is found to be 7. The majority of prescriptions contain more than five drugs (138). that is 44% out of 317 prescriptions. This is represented in table 2 and graph is mentioned in fig.3.

Table 2: Polypharmacy in Prescription.

Prescription Indicators	Frequency (N)	Percentage (%)
No. of prescriptions with more than 5 drugs	138	44%
No. of prescriptions with more than 6 drugs	85	27%
No. of prescriptions with more than 7 drugs	69	21%
No. of prescriptions with more than 8 drugs	25	8%
Total No. of prescriptions	317	100%

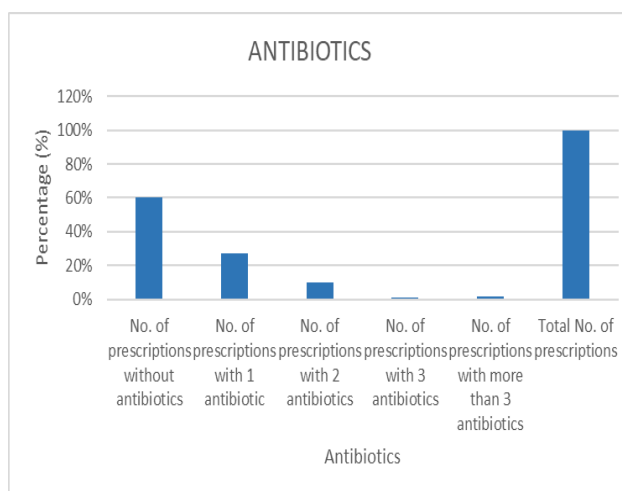
**Figure 3:** Polypharmacy in Prescription.

The total number of antibiotics prescribed was 144. The average number of antibiotics per prescription is 0.96 approximately 1. And it constitutes 15% of the total drugs. Ampicillin is the most frequently prescribed antibiotic. Most of the prescriptions without antibiotics 191. That is 60% out

of 317 prescriptions. The pattern of antibiotics prescription is mentioned in Table 3 and graph is mentioned in fig.4

Table 3: Prescription Pattern of Antibiotics.

Prescription Indicators	Frequency (N)	Percentage (%)
No. of prescriptions without antibiotics	191	60%
No. of prescriptions with 1 antibiotic	87	27%
No. of prescriptions with 2 antibiotics	31	10%
No. of prescriptions with 3 antibiotics	7	1%
No. of prescriptions with more than 3 antibiotics	1	2%
Total No. of prescriptions	317	100%

**Figure 4:** Prescription Pattern of Antibiotics.

Most of the prescriptions without Injectable 153. That is 48% out of 317 prescriptions. The pattern of Injectable prescription is mentioned in Table 4 and graph for Injectable is mentioned in fig.5.

Table 4: Prescription Pattern of Injectable.

Prescription Indicators	Frequency (N)	Percentage (%)
No. of prescriptions without Injectable	153	48%
No. of prescriptions with 1 Injectable	30	10%
No. of prescriptions with 2 Injectable	47	15%
No. of prescriptions with 3 Injectable	42	13%
No. of prescriptions with more than 3 Injectable	45	14%
Total No. of prescriptions	317	100%

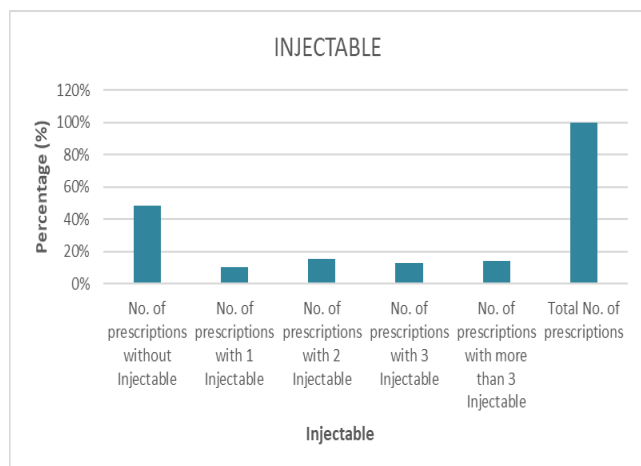


Figure 5: Prescription Pattern of Injectable.

For the measurement of patient care indicators, consultation time is considered. Emergency cases like poisoning are consulted for the least amount of time (0 – 5 min). Cases like hypertension, COPD, diabetes are consulted for a medium amount of time (6 – 10 min). Chronic cases like CKD, AIDS are consulted for a prolonged time (11 – 15 min). This data is mentioned in Table 5 and graph is mentioned in fig.6.

Table 5: Distribution of Patient Care Indicator.

Consultation time: (minutes)	Total no. of Prescriptions (N=317)	Percentage (%)
0-5	45	14%
6-10	217	68%
11-15	55	18%

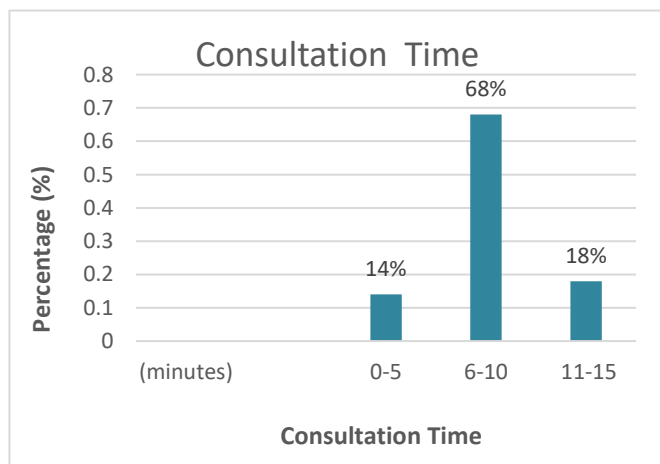


Figure 6: Distribution of Patient Care Indicator.

When the prevalence of diseases is considered 79 patients were suffered from CNS Diseases (25%). 52 patients suffered from CVS diseases (16%). 45 patients suffered from respiratory diseases (14%). 42 patients suffered from Urinary diseases (13%). 38 patients suffered from endocrine diseases (12%). 35 patients suffered from digestive diseases (11%). Disease prevalence is mentioned in Table 6 and graph for disease prevalence is mentioned in fig.7.

Table 6: Disease Prevalence Among Patients.

Indicators	Frequency (N)	Percentage (%)
Cardiovascular system	52	16%
Central nervous system	79	25%
Respiratory system	45	14%
Digestive system	35	11%
Endocrine system	38	12%
Urinary system	42	13%
Circulatory system	18	6%
Immune system	8	3%
Total no. of prescriptions	317	100%

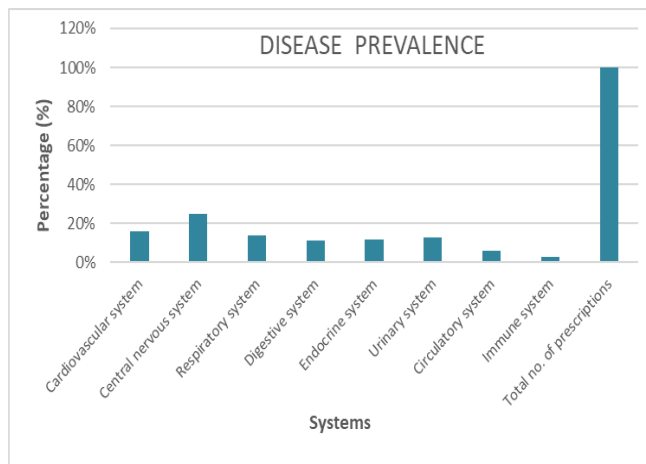


Figure 7: Disease Prevalence Among Patients.

DISCUSSION

There is little information on drug use patterns in the adult population, especially in India. Additionally, this study contributes to our understanding of the drug use patterns and associated problems among adult patients in a community. 317 adult patients total; 174 (55%) were men and 143 (45%) were women. The majority of the patients (89) belonged to the 50–59 age range. Polypharmacy was present in 79 percent of prescriptions. The majority of prescriptions (79%) included five or more medicines, a sign of polypharmacy¹². Patients who use polypharmacies are less likely to take their medications as prescribed. The benefit-risk ratio of drugs should be evaluated, and the final drug combination should be chosen based on the benefits exceeding the hazards¹³. Patients of any gender have been affected by anemia¹⁴. Adult females had a higher prevalence of UTI cases¹⁵. Prescribers gave patients with chronic illnesses, pregnant patients, and elderly patients additional time during consultations¹⁶. There were 144 antibiotic prescriptions written down in total. Antibiotic prescriptions typically consist of 0.96, or roughly 1. Additionally, it makes up 15% of all medications. The antibiotic that is prescribed the most is ampicillin. The most frequent reason for prescribing ciprofloxacin to adult female patients is urinary tract infections. Adults with diabetic foot ulcers were most frequently treated with ceftriaxone and cefotaxime. Cefotaxime is utilized for a variety of ailments, including diabetic foot ulcers, alcoholic

gastritis, uncomplicated febrile seizures, etc. The most commonly given antibiotics were those with broad-spectrum action. On the other hand, hospitalized patients frequently have serious illnesses and require antibiotic treatment right away. Antibiotic therapy is therefore typically started as an empirical measure to treat a wide range of microorganisms¹⁷. The majority of the 153 prescriptions that aren't injectable. Out of 317 prescriptions, that represents 48%. Injectable dose forms account for 38% of all dosage types. Infections linked to injections will be avoided by achieving injection safety and reducing the use of injections¹⁸. Overuse can be decreased by improved patient-prescriber communication as well as managerial strategies (such as limiting access to some unnecessary and hazardous injectable medications).

CONCLUSION

The significance of drug utilization pattern analysis involves its ability to define the denominator data necessary for pharmacoepidemiologic research. The research of drug use is an emerging field. This field of inquiry is growing in part because of the use of computerized databases that, despite certain inherent limitations, connect drug usage to diagnosis. By establishing stronger connections with fields including public health, rational drug use, evidence-based medicine, pharmacovigilance, eco-pharmacovigilance, pharmacogenetics, and pharmacoconomics, drug consumption pattern study gains significance in pharmacoepidemiology. According to the current study, prescribing indicators have almost deviated from expected norms based on WHO indicators. A minor departure from the WHO indicators may result from a number of other clinical factors, co-occurring conditions, or medical professionals' decisions. Every disease should be treated according to a recognized standard therapeutic guideline. This study suggests that until clinicians strictly adhere to the therapeutic guidelines, polypharmacy concerns cannot be addressed.

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