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RATIONALIZING PRESCRIPTION PRACTICES: A CROSS-SECTIONAL ANALYSIS OF DRUG UTILIZATION USING WHO CORE PRESCRIBING INDICATORS

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ABSTRACT

Prescription pattern analysis is a valuable tool for evaluating drug utilization practices and promoting rational use of medicines in healthcare settings. The present study was conducted to assess the prescribing pattern of drugs among patients attending a tertiary care hospital using World Health Organization (WHO) core prescribing indicators. A retrospective observational study was carried out over a period of six months, during which 100 prescriptions were systematically collected and analysed using a structured data collection form. Parameters such as patient demographics, disease distribution, number of drugs per prescription, therapeutic classes, dosage forms, route of administration, use of antibiotics and injections, fixed dose combinations, and generic prescribing were evaluated.

This article highlights the prevailing prescribing trends, extent of polypharmacy, and adherence to principles of rational drug use in the study setting. The average number of drugs per prescription was 3.2, with antibiotics prescribed in 40% of encounters and injections in 16% of cases. Generic prescribing was observed in 70% of prescriptions, while fixed dose combinations accounted for 22% of the total drugs prescribed. The study emphasizes the need for regular prescription auditing, continuous medical education, and strict implementation of standard treatment guidelines to improve rational prescribing practices and enhance patient safety.

Keywords: Prescription pattern analysis; Drug utilization study; WHO prescribing indicators; Rational drug use; Polypharmacy

1. INTRODUCTION

Rational use of medicines is a fundamental component of effective healthcare delivery, ensuring that patients receive appropriate drugs in correct doses for an adequate duration at the lowest possible cost. Irrational prescribing practices such as polypharmacy, inappropriate use of antibiotics, excessive use of injections, and brand-based prescribing can lead to increased healthcare costs, adverse drug reactions, antimicrobial resistance, and poor therapeutic outcomes. Prescription pattern analysis serves as an important method to evaluate drug utilization trends and identify deviations from standard treatment guidelines[1,2].

The World Health Organization (WHO) has developed core prescribing indicators to assess prescribing behaviour and promote rational drug use in clinical practice. These indicators include the average number of drugs per prescription, percentage of drugs prescribed by generic name, percentage of encounters with antibiotics and injections, and percentage of drugs prescribed from the essential medicines list. Regular

assessment of these indicators helps in monitoring prescribing practices and implementing corrective measures[3].

In developing countries like India, prescription pattern studies are particularly important due to variations in disease prevalence, prescribing habits, and availability of medicines. Such studies provide valuable baseline data for healthcare institutions, support evidence-based decision making, and contribute to improving the quality of patient care. Therefore, the present study was undertaken to analyse the prescription pattern of drugs using WHO prescribing indicators in a tertiary care hospital[4].

2. AIM AND OBJECTIVES

AIM

The primary aim of the present study is to evaluate the prescription pattern of drugs prescribed to patients attending a tertiary care hospital in order to assess the rationality, safety, and appropriateness of prescribing practices using World Health Organization (WHO) core prescribing indicators. The study also aims to identify prevailing drug utilization trends and potential areas of irrational prescribing that may require intervention[5].

OBJECTIVES

- To study the demographic and clinical characteristics of patients whose prescriptions were included in the study.
- To analyse the average number of drugs prescribed per prescription and assess the extent of polypharmacy.
- To evaluate the pattern of drug utilization based on therapeutic categories and commonly prescribed drug classes.
- To determine the frequency and appropriateness of antibiotic prescribing in the study population.
- To assess the use of injectable formulations in comparison with oral dosage forms.
- To evaluate the proportion of drugs prescribed by generic name versus brand name.
- To analyse the utilization of fixed dose combinations and their rationality in clinical practice.
- To assess prescribing practices in relation to WHO core prescribing indicators.
- To identify deviations from standard treatment guidelines and areas requiring improvement in rational drug use.
- To provide baseline data that may assist healthcare professionals and policy makers in improving prescribing practices and optimizing patient care[6].

3.MATERIALS AND METHODS

3.1 STUDY DESIGN

The present investigation was conducted as a retrospective, observational, and descriptive study aimed at evaluating the prescribing pattern of drugs in a tertiary care hospital. The study involved systematic review of previously issued prescriptions without any form of intervention, interaction with patients, or alteration in the therapeutic decisions made by the prescribers. The observational nature of the study allowed assessment of real-world prescribing practices and identification of rational as well as irrational trends in drug utilization. Evaluation was performed in accordance with World Health Organization (WHO) core prescribing indicators to ensure standardization and reliability of findings[7].

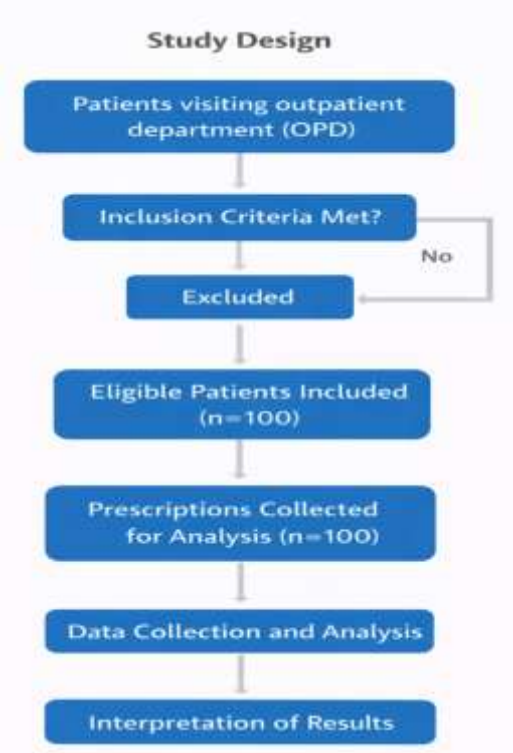

Figure 1: Flowchart representing the study design for prescription pattern analysis

3.2 STUDY SITE

The study was carried out in the outpatient department (OPD) of a tertiary care teaching hospital that provides comprehensive healthcare services to a diverse population from surrounding urban and rural areas. The hospital functions as a referral center and caters to patients with varied medical conditions. Prescriptions issued by registered medical practitioners from different departments during routine clinical practice were considered for analysis, thereby reflecting actual prescribing behaviour[8].

3.3 STUDY DURATION

The study was conducted over a period of three months. This duration was chosen to ensure adequate collection of prescriptions and to minimize the influence of short-term prescribing variations or seasonal disease patterns. The extended study period allowed for a more representative assessment of prescribing practices[9].

3.4 STUDY POPULATION

The study population consisted of patients of both genders and all age groups who attended the outpatient department during the study period. Prescriptions from patients diagnosed with various acute and chronic illnesses were included in order to obtain a broad overview of drug utilization trends. The study did not restrict the population based on disease condition, thereby allowing comprehensive evaluation of prescribing patterns across multiple therapeutic categories[10].

3.5 INCLUSION CRITERIA

- Prescriptions issued to patients attending the outpatient department during the study period
- Prescriptions containing two or more drugs
- Prescriptions issued to patients of either gender and all age groups
- Prescriptions that were complete, clearly written, and contained adequate treatment details[11]

3.6 EXCLUSION CRITERIA

- Illegible or incomplete prescriptions
- Prescriptions from inpatient department (IPD), emergency department, or critical care units
- Prescriptions containing only a single drug
- - Follow-up or duplicate prescriptions of the same patient collected during the study period[12]

3.7 SAMPLE SIZE

A total of 100 prescriptions were randomly selected and included in the study. Random selection was adopted to reduce selection bias and to ensure that the sample adequately represented routine prescribing practices followed in the outpatient department[13].

3.8 DATA COLLECTION METHOD

Data were collected retrospectively from patient prescriptions using a structured and pre-validated data collection form. The parameters recorded included patient demographic details such as age and gender, diagnosis, total number of drugs per prescription, therapeutic class of drugs, drug name (generic or brand), dosage form, route of administration, frequency, duration of therapy, use of antibiotics, injectable preparations, and fixed dose combinations. All collected data were anonymized to maintain patient confidentiality, and no personal identifiers were recorded during the study[14].

Figure 2: Flowchart depicting the data collection method used in the prescription pattern analysis study.

3.9 STUDY PARAMETERS

Thiswasacross-sectionalstudyconductedinahospitalpharmacy.Weevaluatedprescriptionsof outpatients coming to hospital pharmacy for drug dispensing. Hundred prescriptions writtenby physicians from various specialties were studied. Institutional Ethics Committee permission was obtained. The prescribing doctors were not aware of the study being done.

Errors on the prescription were evaluated. To analyze the prescription patterns a checklist of essential parameters according to WHO guidelines for prescription writing was made.

Parametersincluded:

(a) Prescriberinformation:Hospitalsname,address,informationaboutthedepartmentandunit, detailsaboutprescriberi.e.name,designationandsignature.Forresultsrefertableno. ……andfigure no…….

(b) Patient information: Name, age, sex, weight, and address ofthe patient and date of issuing prescription.

(c) Details of each medication prescribed: Generic/Brand name, strength, and frequency of administration, quantity to be dispensed, route, dosage form and instructions for use of the medication. Use of abbreviations if any was also noted.

(d) Legibility of handwriting: In this we analyzed legibility of physician's handwriting on the prescriptionsonasubjectivescaleas:Grade1:Moderatelylegible,Grade2:Barelylegible,Grade 3: Illegible.

(e) Prescribeddrugstudy: Evaluationofdrug interaction

Prescriptions were carefully analyzed for above mentioned parameters to know how many prescriptions prescribe by physician are complete i.e. prescription which contain all parameters and without any drug interaction

3.10 STATISTICAL ANALYSIS

The collected data were systematically entered into Microsoft Excel and analysed using descriptive statistical methods. Quantitative variables were expressed as mean values, while qualitative variables were presented as frequencies and percentages. The results were summarized and presented in the form of tables and graphical representations to facilitate better understanding and interpretation of the data[16].

Table 1:Study Design and Methodology Overview

Parameter	Description
Study Design	Retrospective, observational, descriptive study
Study Site	Outpatient department (OPD) of a tertiary care teaching hospital
Study Duration	Three months
Study Population	Patients of all age groups and both genders attending OPD
Inclusion Criteria	Prescriptions with ≥2 drugs, complete and legible, from OPD patients
Exclusion Criteria	Incomplete/illegible prescriptions, IPD/emergency prescriptions, single-drug prescriptions, follow-up prescriptions
Sample Size	100 prescriptions randomly collected
Data Collection Method	Structured data collection form; recorded demographics, diagnosis, drug name, dosage form, route, frequency, duration, fixed dose combinations, generic/brand
Study Parameters	WHO core prescribing indicators: average number of drugs per prescription, % generic drugs, % encounters with antibiotics, % encounters with injections, % drugs from essential medicines list
Statistical Analysis	Descriptive statistics using Microsoft Excel; results expressed as mean, frequencies, percentages; tables and graphs used for presentation

4. RESULTS

Total 100 prescriptions were analyzed on which totalof 356 drugs were prescribed with anaverage of 3.5 drugs per prescription.

In this studyfollowingparameters were studied

Table2:Prescriber Information

Prescription number	Hospital details	Department	Name of prescriber	Designation	Signature of physician	Superscription (R_x)	Regd. no
Prescription1	1	0	1	1	1	1	1
Prescription2	1	1	1	1	0	1	0
Prescription3	1	0	1	1	0	1	0
Prescription4	1	1	1	1	1	1	0
Prescription5	1	1	1	1	1	1	0
Prescription6	1	1	1	1	1	1	0
Prescription7	1	1	1	1	0	1	1
Prescription8	1	1	1	1	0	1	0
Prescription9	1	0	1	1	0	1	0
Prescription10	1	1	1	1	1	1	1

Prescription11	1	0	0	1	1	1	0
Prescription12	1	1	1	1	1	1	1
Prescription13	1	0	1	0	0	1	0
Prescription14	1	1	1	1	0	1	1
Prescription15	1	0	1	1	1	1	0
Prescription16	1	1	1	1	0	1	1
Prescription17	1	1	1	1	0	1	0
Prescription18	1	0	1	1	0	1	0
Prescription19	1	1	1	1	0	1	1
Prescription20	1	1	0	1	0	1	0
Prescription21	1	1	1	1	0	1	0
Prescription22	1	0	1	1	1	1	1
Prescription23	1	1	1	1	0	1	1
Prescription24	1	1	1	1	1	1	1
Prescription25	1	1	1	1	1	1	1
Prescription26	1	1	1	1	1	1	1
Prescription27	1	1	1	1	0	1	1
Prescription28	1	1	1	1	0	1	1
Prescription29	1	0	1	1	1	1	0
Prescription30	1	1	1	1	0	1	1
Prescription31	1	1	1	1	1	1	0
Prescription32	1	1	0	1	0	1	0
Prescription33	1	1	1	1	1	1	1
Prescription34	1	0	1	1	0	1	0
Prescription35	1	1	1	1	0	1	1
Prescription36	1	1	0	1	0	1	0
Prescription37	1	1	1	1	0	1	1
Prescription38	1	1	1	1	0	1	1
Prescription39	1	1	1	1	1	1	1
Prescription40	1	0	1	1	0	1	0
Prescription41	1	0	1	1	0	1	0
Prescription42	1	1	1	1	1	1	1
Prescription43	1	0	1	1	1	1	0
Prescription44	1	1	1	1	0	1	1
Prescription45	1	0	1	1	1	1	1
Prescription46	1	0	1	1	0	1	0
Prescription47	1	1	1	1	0	1	1
Prescription48	1	1	1	1	0	1	0
Prescription49	1	0	1	1	1	1	0
Prescription50	1	0	0	1	1	1	0
Prescription51	1	1	1	1	1	1	1
Prescription52	1	0	1	1	1	1	0
Prescription53	1	1	1	1	0	1	0
Prescription54	1	1	1	1	1	1	0
Prescription55	1	0	1	1	0	1	0
Prescription56	0	1	1	0	0	1	1
Prescription57	1	1	1	1	1	1	0
Prescription58	1	1	1	1	0	1	0
Prescription59	1	1	1	1	0	1	0
Prescription60	1	0	1	1	0	1	0
Prescription61	1	1	1	1	0	1	1
Prescription62	0	1	1	1	0	1	1
Prescription63	1	1	1	0	1	1	0
Prescription64	1	1	1	1	0	1	0
Prescription65	1	1	1	1	1	1	0

Prescription66	1	0	1	1	0	1	0
Prescription67	1	1	1	1	0	1	1
Prescription68	1	0	1	1	0	1	0
Prescription69	1	0	1	1	0	1	0
Prescription70	1	0	1	1	0	1	0
Prescription71	1	1	1	1	0	1	1
Prescription72	1	1	1	1	0	1	1
Prescription73	1	1	1	1	0	1	1
Prescription74	1	1	1	1	0	1	1
Prescription75	1	1	1	1	1	1	0
Prescription76	1	1	0	0	1	0	0
Prescription77	1	0	1	1	0	1	0
Prescription78	1	1	0	0	0	1	0
Prescription79	1	1	1	1	0	1	1
Prescription80	1	1	1	1	0	1	0
Prescription81	1	0	1	1	1	0	1
Prescription82	1	0	1	1	1	0	1
Prescription83	1	0	1	0	1	1	1
Prescription84	1	0	1	1	0	1	1
Prescription85	0	0	0	1	0	1	0
Prescription86	1	1	1	1	1	1	1
Prescription87	1	0	0	1	1	1	0
Prescription88	1	1	1	1	0	1	0
Prescription89	1	0	0	1	1	1	0
Prescription90	0	0	0	0	0	1	0
Prescription91	1	0	1	0	0	1	0
Prescription92	1	0	1	1	1	1	0
Prescription93	1	0	1	1	0	1	1
Prescription94	1	1	1	1	0	1	1
Prescription95	1	0	1	1	0	0	0
Prescription96	1	1	1	1	0	1	0
Prescription97	0	0	0	0	0	1	0
Prescription98	1	1	1	1	1	1	0
Prescription99	1	1	1	1	0	1	0
Prescription100	1	0	0	1	1	1	0

“1”:√(Parameterpresent),“0”:×(Parameter absent)

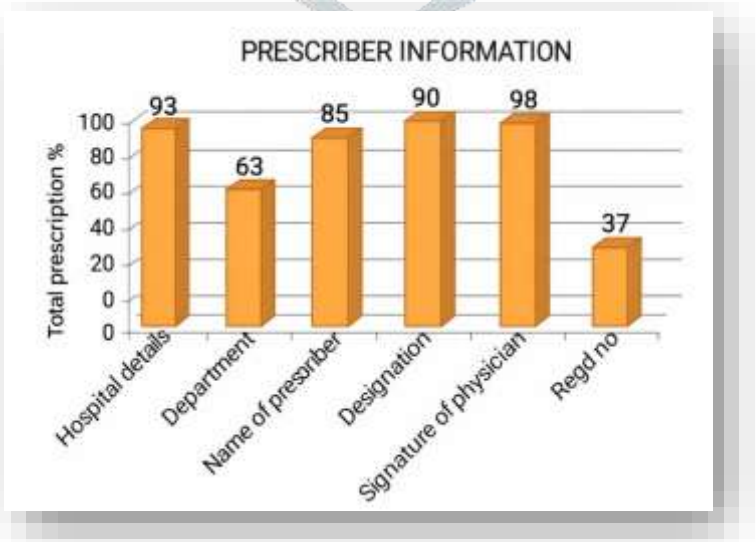

Figure 3: PrescriberInformation

Prescriber Information: Hospitals name and address was printed in 93% all prescriptions.The name of the department was mentioned in 63% of the prescriptions, the name and designation of prescribing doctor was found in 85% and 90% respectively, out of 100 prescriptions only 98% prescriptions were signed by the physicians and only 37% prescription have physician Regd. No. (Figure 5)

Table 3: Patient Information

Prescriptionno.	Patients Name	Age	Sex	Weight	Address	Dateof issue
Prescription1	1	1	1	0	0	1
Prescription2	1	1	1	0	0	1
Prescription3	1	1	1	0	0	1
Prescription4	1	1	0	0	0	1
Prescription5	1	1	1	0	0	1
Prescription6	1	1	1	0	0	1
Prescription7	1	1	1	0	0	1
Prescription8	1	1	0	0	0	1
Prescription9	1	0	0	0	0	1
Prescription10	1	1	1	0	0	1
Prescription11	1	1	0	0	0	1
Prescription12	1	0	1	0	0	1
Prescription13	1	0	1	0	0	1
Prescription14	1	1	1	0	0	1
Prescription15	1	0	1	0	0	1
Prescription16	1	1	1	0	0	1
Prescription17	1	0	0	0	0	1
Prescription18	1	0	1	0	0	1
Prescription19	1	1	0	0	0	1
Prescription20	1	0	1	0	0	1
Prescription21	1	1	1	1	0	1
Prescription22	1	1	1	0	0	1
Prescription23	1	1	1	0	0	1
Prescription24	1	1	1	0	0	1
Prescription25	1	1	1	0	0	1
Prescription26	1	1	1	0	0	1
Prescription27	1	1	1	0	0	1
Prescription28	1	1	1	0	0	1
Prescription29	1	1	1	0	0	1
Prescription30	1	1	1	0	0	1
Prescription31	1	1	1	0	0	1
Prescription32	1	1	1	0	0	1
Prescription33	1	1	1	0	0	1
Prescription34	1	1	1	0	0	1
Prescription35	0	0	0	0	0	1
Prescription36	1	0	0	0	0	1
Prescription37	1	1	1	1	0	1
Prescription38	1	1	1	1	0	1
Prescription39	1	1	1	0	0	1
Prescription40	1	0	1	0	0	1
Prescription41	1	0	1	0	0	1
Prescription42	1	1	1	1	0	1
Prescription43	1	1	0	0	0	1
Prescription44	0	0	0	0	0	1
Prescription45	1	1	1	0	0	1

Prescription46	1	0	0	0	0	1
Prescription47	1	1	1	0	0	1
Prescription48	1	1	1	0	0	1
Prescription49	0	0	0	0	0	1
Prescription50	1	0	0	0	0	1
Prescription51	1	1	1	1	0	1
Prescription52	1	0	0	0	0	1
Prescription53	1	1	0	1	0	1
Prescription54	1	0	0	0	0	1
Prescription55	1	1	0	0	0	1
Prescription56	1	0	0	0	0	1
Prescription57	1	0	0	0	0	1
Prescription58	1	0	0	0	0	1
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Prescription62	1	1	1	0	0	1
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Prescription64	1	1	0	0	0	1
Prescription65	1	0	0	0	0	1
Prescription66	0	0	0	0	0	1
Prescription67	1	0	0	0	0	1
Prescription68	1	0	1	0	0	1
Prescription69	1	1	1	0	0	1
Prescription70	1	0	1	0	0	1
Prescription71	1	0	0	0	0	1
Prescription72	1	0	0	0	0	1
Prescription73	1	0	0	0	0	1
Prescription74	1	1	1	0	0	1
Prescription75	1	1	1	0	0	1
Prescription76	1	1	1	1	1	1
Prescription77	1	0	1	0	0	1
Prescription78	1	0	0	0	0	1
Prescription79	1	1	1	1	1	1
Prescription80	1	1	1	0	0	1
Prescription81	1	0	0	0	0	1
Prescription82	1	0	0	0	0	1
Prescription83	0	0	0	0	0	1
Prescription84	0	0	0	0	0	1
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Prescription92	1	0	1	0	0	1
Prescription93	1	0	0	0	0	1
Prescription94	1	0	0	0	0	1
Prescription95	1	0	0	0	0	1
Prescription96	1	1	0	0	0	1
Prescription97	0	1	1	1	0	1
Prescription98	1	1	1	0	0	1
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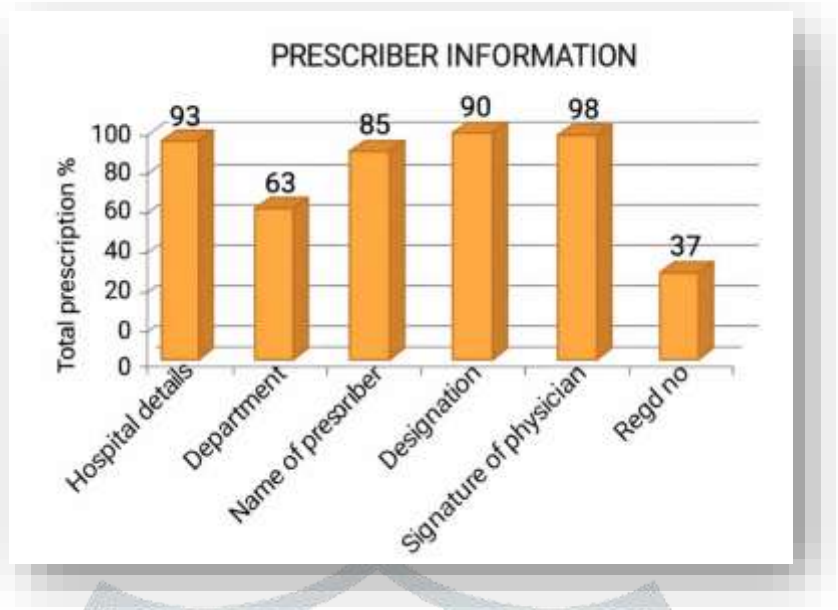

Figure4:PrescriberInformation

Prescriber Information: Hospitals name and address was printed in 93% all prescriptions.The name of the department was mentioned in 63% of the prescriptions, the name and designation of prescribing doctor was found in 85% and 90% respectively, out of 100 prescriptions only 98% prescriptions were signed by the physicians and only 37% prescription have physician Regd. No. (Figure 4)

Table 4: PatientInformation

Prescriptionno.	Patients Name	Age	Sex	Weight	Address	Dateof issue
Prescription1	1	1	1	0	0	1
Prescription2	1	1	1	0	0	1
Prescription3	1	1	1	0	0	1
Prescription4	1	1	0	0	0	1
Prescription5	1	1	1	0	0	1
Prescription6	1	1	1	0	0	1
Prescription7	1	1	1	0	0	1
Prescription8	1	1	0	0	0	1
Prescription9	1	0	0	0	0	1
Prescription10	1	1	1	0	0	1
Prescription11	1	1	0	0	0	1
Prescription12	1	0	1	0	0	1
Prescription13	1	0	1	0	0	1
Prescription14	1	1	1	0	0	1
Prescription15	1	0	1	0	0	1
Prescription16	1	1	1	0	0	1
Prescription17	1	0	0	0	0	1
Prescription18	1	0	1	0	0	1
Prescription19	1	1	0	0	0	1
Prescription20	1	0	1	0	0	1
Prescription21	1	1	1	1	0	1
Prescription22	1	1	1	0	0	1
Prescription23	1	1	1	0	0	1
Prescription24	1	1	1	0	0	1
Prescription25	1	1	1	0	0	1
Prescription26	1	1	1	0	0	1
Prescription27	1	1	1	0	0	1

Prescription28	1	1	1	0	0	1
Prescription29	1	1	1	0	0	1
Prescription30	1	1	1	0	0	1
Prescription31	1	1	1	0	0	1
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Prescription33	1	1	1	0	0	1
Prescription34	1	1	1	0	0	1
Prescription35	0	0	0	0	0	1
Prescription36	1	0	0	0	0	1
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Prescription42	1	1	1	1	0	1
Prescription43	1	1	0	0	0	1
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Prescription45	1	1	1	0	0	1
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Prescription66	0	0	0	0	0	1
Prescription67	1	0	0	0	0	1
Prescription68	1	0	1	0	0	1
Prescription69	1	1	1	0	0	1
Prescription70	1	0	1	0	0	1
Prescription71	1	0	0	0	0	1
Prescription72	1	0	0	0	0	1
Prescription73	1	0	0	0	0	1
Prescription74	1	1	1	0	0	1
Prescription75	1	1	1	0	0	1
Prescription76	1	1	1	1	1	1
Prescription77	1	0	1	0	0	1
Prescription78	1	0	0	0	0	1
Prescription79	1	1	1	1	1	1
Prescription80	1	1	1	0	0	1
Prescription81	1	0	0	0	0	1
Prescription82	1	0	0	0	0	1

Prescription83	0	0	0	0	0	1
Prescription84	0	0	0	0	0	1
Prescription85	0	0	0	0	0	1
Prescription86	1	1	1	1	0	1
Prescription87	1	1	1	0	1	1
Prescription88	1	1	1	1	0	1
Prescription89	1	1	1	0	1	1
Prescription90	0	0	0	0	0	1
Prescription91	0	0	0	0	0	0
Prescription92	1	0	1	0	0	1
Prescription93	1	0	0	0	0	1
Prescription94	1	0	0	0	0	1
Prescription95	1	0	0	0	0	1
Prescription96	1	1	0	0	0	1
Prescription97	0	1	1	1	0	1
Prescription98	1	1	1	0	0	1
Prescription99	1	1	1	0	0	1
Prescription100	1	0	0	0	0	0

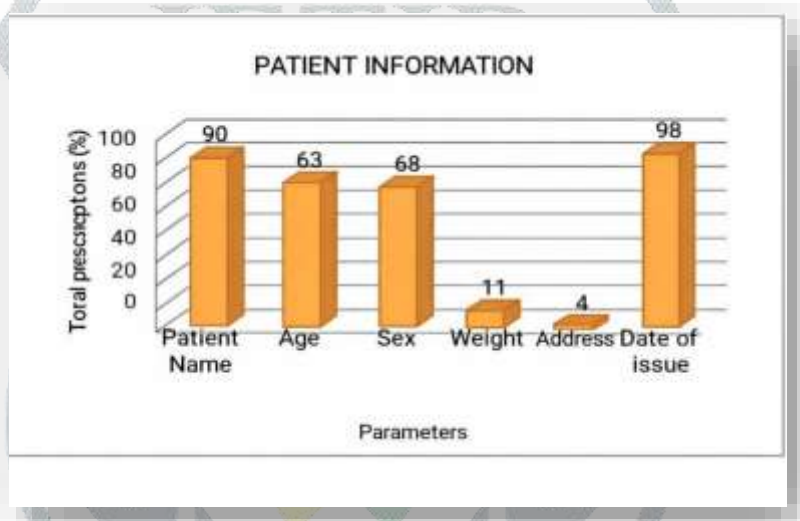

Figure5: Adequacyof PatientInformation

Patient Information: The patient's name, age and sex were present on 90%, 63% and 68% respectively. Date of issuing prescriptions was mentioned in 98% cases but weight and address was mentioned only in 11% and 4% of prescriptions respectively [Figure 5].

Table 5: Details ofeachmedication prescribed

Prescription No.	Strength of dose	Frequency of administration	ROA	Dosage Form	Quantity to be dispensed	Instructions for use
1	0	0	0	0	0	0
2	0	1	1	0	1	0
3	1	1	1	1	1	0
4	0	1	0	0	0	0
5	0	0	0	1	1	0
6	0	0	0	0	1	0
7	0	1	0	0	0	0
8	0	1	0	0	1	1
9	0	1	0	0	1	0
10	0	1	0	1	1	1
11	0	0	0	0	0	0

12	0	1	0	0	0	0
13	0	1	0	0	0	0
14	0	1	0	0	0	0
15	0	1	0	0	0	0
16	0	1	0	0	0	0
17	0	1	0	0	0	0
18	0	1	0	0	0	0
19	0	0	0	0	0	0
20	0	1	0	0	0	0
21	0	1	0	1	0	0
22	0	0	0	1	0	0
23	0	0	0	0	0	0
24	0	0	0	0	1	0
25	0	1	0	0	0	0
26	0	1	0	0	0	0
27	0	0	0	0	0	0
28	0	0	0	0	0	0
29	0	0	0	0	0	0
30	0	1	1	0	0	0
31	0	1	0	0	0	0
32	0	0	0	0	1	0
33	0	0	0	0	0	0
34	0	0	0	0	0	1
35	0	0	0	0	1	0
36	0	1	0	0	0	0
37	0	1	0	0	1	0
38	0	1	0	0	1	0
39	0	1	0	0	1	0
40	0	1	0	0	0	0
41	0	1	0	0	0	0
42	0	1	0	0	1	0
43	0	1	0	0	1	0
44	0	1	0	0	0	0
45	0	0	0	0	0	0
46	0	1	0	0	1	0
47	0	1	0	0	1	0
48	0	1	0	0	0	0
49	0	1	0	0	0	0
50	0	1	0	0	0	0
51	0	1	0	1	0	0
52	0	1	0	0	1	0
53	0	1	0	0	1	0
54	0	1	0	0	1	0
55	0	0	0	0	0	0
56	0	1	0	0	0	0
57	0	1	0	0	0	0
58	0	1	0	0	1	0
59	0	1	0	0	1	0
60	0	1	0	0	0	0
61	0	1	0	0	0	0
62	0	1	0	0	1	0
63	0	1	0	0	0	0
64	0	1	0	0	0	0
65	0	1	0	0	0	0
66	0	1	0	0	0	0

67	0	0	0	0	0	0
68	0	1	0	0	0	0
69	0	0	0	0	1	0
70	0	1	0	0	0	0
71	0	0	0	0	0	0
72	0	0	0	0	0	0
73	0	0	0	0	0	0
74	0	1	0	0	0	0
75	0	1	0	0	1	0
76	0	0	0	0	0	0
77	0	1	0	0	0	0
78	0	1	0	0	1	0
79	0	1	0	0	0	0
80	0	1	0	0	1	0
81	0	1	0	0	0	0
82	0	1	0	0	0	0
83	0	1	0	0	0	0
84	0	0	0	0	0	0
85	0	1	0	0	0	0
86	0	1	0	0	1	0
87	0	1	0	0	1	0
88	0	1	0	0	0	0
89	0	1	0	0	1	0
90	0	1	0	0	0	0
91	0	0	0	0	0	0
92	0	1	0	0	1	0
93	0	1	0	0	0	0
94	0	0	0	0	0	0
95	0	0	0	0	0	0
96	0	1	0	0	0	0
97	0	1	0	0	1	0
98	0	1	0	0	1	0
99	0	1	0	0	1	0
100	0	1	0	0	0	0

ROA: Route of administration
"1":√(Parameterpresent),"0":×(Parameterabsent)

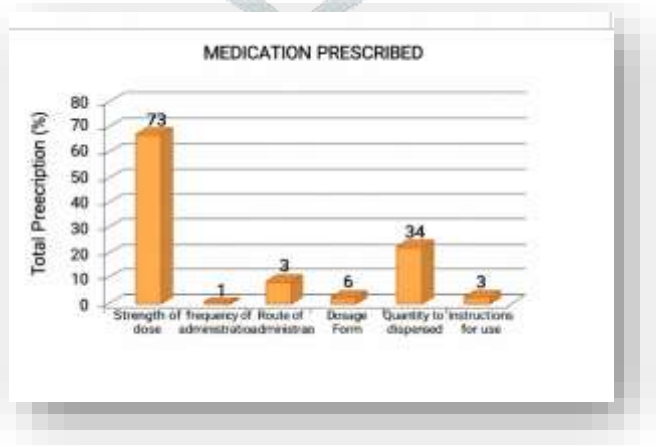

Figure6:Detailsofeachmedicationprescribed

Details of each Medication Prescribed: Strength of medication and the frequency of administration were mentioned in 73% and 1% of prescriptions respectively. Dosage form and quantity to be dispensed were mentioned in 34 % of prescriptions. But route of administration and instruction for the use of drug was

specified only 3% of prescriptions respectively. (Figure6)

Table6: Legibilityof Handwriting

PrescriptionNo.	Grade1	Grade2	Grade3
Prescription1	0	1	0
Prescription2	0	0	1
Prescription3	1	0	0
Prescription4	0	1	0
Prescription5	0	1	0
Prescription6	0	0	1
Prescription7	0	0	1
Prescription8	0	0	1
Prescription9	0	0	1
Prescription10	0	1	0
Prescription11	0	0	1
Prescription12	0	0	1
Prescription13	0	1	0
Prescription14	0	0	1
Prescription15	0	1	0
Prescription16	0	1	0
Prescription17	0	1	0
Prescription18	0	1	0
Prescription19	1	0	0
Prescription20	0	1	0
Prescription21	0	0	1
Prescription22	1	0	0
Prescription23	0	1	0
Prescription24	0	0	1
Prescription25	0	0	1
Prescription26	0	0	1
Prescription27	1	0	0
Prescription28	0	0	1
Prescription29	0	1	0
Prescription30	0	0	1
Prescription31	1	0	0
Prescription32	0	1	0
Prescription33	1	0	0
Prescription34	1	0	0
Prescription35	0	0	1
Prescription36	0	0	1
Prescription37	0	1	0
Prescription38	0	1	0
Prescription39	1	0	0
Prescription40	0	1	0
Prescription41	0	1	0
Prescription42	1	0	0
Prescription43	0	1	0
Prescription44	0	0	1
Prescription45	1	0	0
Prescription46	0	1	0
Prescription47	0	0	1
Prescription48	0	0	1
Prescription49	0	1	0
Prescription50	0	0	1

Prescription51	0	1	0
Prescription52	0	1	0
Prescription53	0	0	1
Prescription54	0	0	1
Prescription55	1	0	0
Prescription56	0	0	1
Prescription57	0	0	1
Prescription58	0	0	1
Prescription59	0	1	0
Prescription60	0	1	0
Prescription61	0	0	1
Prescription62	0	0	1
Prescription63	0	0	1
Prescription64	0	0	1
Prescription65	0	0	1
Prescription66	0	1	0
Prescription67	0	0	1
Prescription68	1	0	0
Prescription69	0	0	1
Prescription70	0	1	0
Prescription71	0	0	1
Prescription72	0	0	1
Prescription73	0	0	1
Prescription74	0	0	1
Prescription75	0	0	1
Prescription76	0	1	0
Prescription77	0	1	0
Prescription78	0	0	1
Prescription79	0	1	0
Prescription80	1	0	0
Prescription81	0	0	1
Prescription82	0	0	1
Prescription83	0	0	1
Prescription84	0	0	1
Prescription85	0	0	1
Prescription86	0	1	0
Prescription87	0	1	0
Prescription88	0	0	1
Prescription89	0	1	0
Prescription90	0	0	1
Prescription91	1	0	0
Prescription92	0	1	0
Prescription93	0	0	1
Prescription94	0	0	1
Prescription95	0	1	0
Prescription96	0	1	0
Prescription97	0	0	1
Prescription98	0	0	1
Prescription99	0	0	1
Prescription100	0	0	1

“1”:√(Parameterpresent),“0”:×(Parameterabsent)

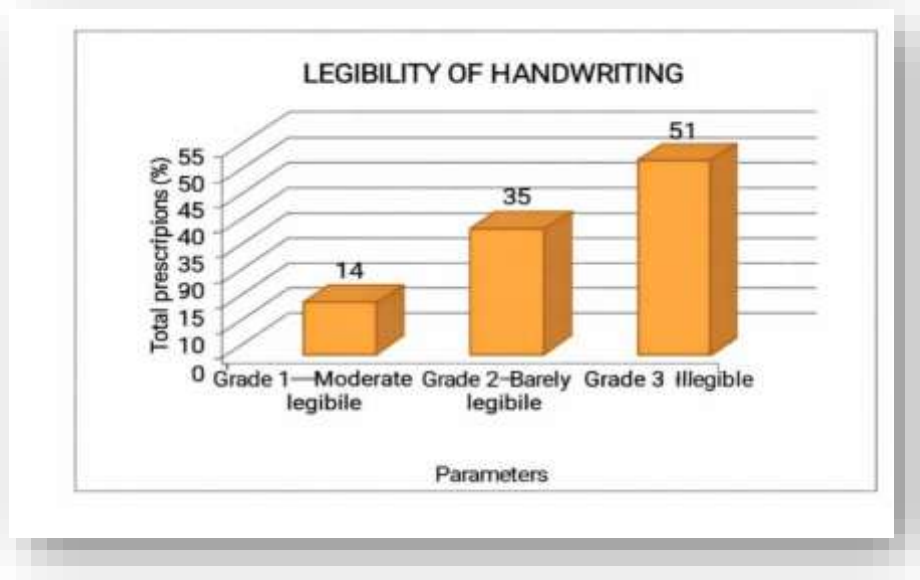

Figure7:Legibilityofhandwriting

*Legibility of Handwriting:*100 prescriptions were analyzed for their Legibility of handwriting in three groups according to their readability. 14% prescriptions were in Grade 1 (Moderately Legible), 35% prescriptions were in Grade 2 (Barely Legible) but 51% of prescriptions were in grade 3 (not readable) illegible. (Figure 7)

5. DISCUSSION

Prescription pattern analysis plays a crucial role in identifying trends in drug utilization, promoting rational prescribing practices, and ensuring patient safety. In the present study, a total of 100 prescriptions were analysed to evaluate prescribing behaviour in a tertiary care hospital using WHO core prescribing indicators.

The demographic analysis indicated that adult patients aged 18–60 years formed the majority of the study population, which aligns with previous studies suggesting that adults are the most frequent users of outpatient services. A slightly higher proportion of male patients was observed, which may reflect sociocultural factors affecting healthcare access.

Disease distribution showed that gastrointestinal disorders, cardiovascular diseases, diabetes, and respiratory conditions were most commonly encountered. This is consistent with other prescription pattern studies conducted in tertiary care hospitals, where lifestyle-related and chronic diseases dominate outpatient prescriptions.

The analysis of drug classes revealed that antibiotics, analgesics, proton pump inhibitors, antihypertensives, and antidiabetic agents were the most frequently prescribed drugs. While the use of antibiotics in 40% of prescriptions falls slightly above the WHO recommended standard (20–26%), it emphasizes the need for careful antibiotic stewardship to prevent antimicrobial resistance. Injectable formulations were prescribed in 16% of prescriptions, which is within the WHO recommended range (13–24%) and reflects judicious use of parenteral therapy. Generic prescribing was observed in 70% of drugs, indicating partial adherence to rational prescribing principles. Encouraging complete generic prescribing can improve cost-effectiveness and accessibility for patients.

The average number of drugs per prescription was 3.2, indicating moderate polypharmacy. Polypharmacy was more prevalent in prescriptions for patients with multiple comorbidities, which is expected; however, excessive polypharmacy increases the risk of drug-drug interactions, adverse drug reactions, and higher treatment costs. These findings highlight the importance of continuous prescription audits, prescriber education, and adherence to standard treatment guidelines to promote rational drug use.

Overall, the results of this study are consistent with similar research conducted in tertiary care hospitals in India, which emphasizes the need for interventions to improve rational prescribing, particularly regarding

antibiotic use and generic drug prescribing. Regular monitoring, prescription evaluation, and awareness programs for prescribers are essential to optimize drug utilization and ensure patient safety[20,21].

6. CONCLUSION

The present study provided valuable insights into the prescribing patterns of drugs in a tertiary care hospital using WHO core prescribing indicators. Analysis of 100 prescriptions revealed that the majority of prescriptions were for adult patients, with a higher prevalence of gastrointestinal, cardiovascular, diabetes, and respiratory conditions. Oral administration was the most preferred route, and commonly prescribed drugs included antibiotics, analgesics, antihypertensives, and antidiabetic agents.

The average number of drugs per prescription indicated moderate polypharmacy, while generic prescribing and injectable use were partially aligned with WHO recommendations. Antibiotic prescribing was slightly higher than recommended standards, suggesting a need for antibiotic stewardship programs.

This article highlights that while most prescribing practices were rational, there remains scope for improvement in areas such as reducing polypharmacy, promoting generic prescribing, and minimizing unnecessary antibiotic use. Continuous prescription audits, implementation of standard treatment guidelines, and prescriber education are essential strategies to enhance rational drug use, reduce treatment costs, and improve overall patient safety and healthcare outcomes.

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