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RESEARCH ARTICLE
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PRESCRIPTION AUDIT IN AN OUTPATIENT DEPARTMENT PHARMACY OF A TERTIARY CARE TEACHING HOSPITAL OF ODISHA

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Abstract

Background: A prescription audit is a quality improvement process to improve patient care. In order to maximize patient outcomes and reduce the risk of adverse drug reactions (ADRs) and medication errors, prescription audits are essential for evaluating prescribing trends and guaranteeing adherence to established treatment guidelines. According to estimates, half of all patients do not take their medications as directed, and more than half of all medications are prescribed, distributed, or sold improperly worldwide. Therefore, prescription auditing is a crucial tool for preventing drug abuse and promoting more rational drug use.

Methodology: It is a prospective observational study conducted at the District Head Quarter Hospital & Shri Jagannath Medical college and Hospital (SJ MCH), Puri. The prescriptions were collected and analyzed using World Health Organization (WHO) core indicators.

Results: The average number of prescription was reported to be at 3.99. The percentage of prescription with generic name was 93%. The percentage of prescriptions containing antibiotic was 17%. The percentage of drugs from Essential Drug List (EDL) was 90%. The percentage of prescriptions containing injections was 5.68%.

Conclusion: This prescription audit conducted in the outpatient department of a tertiary care teaching hospital in Odisha reveals an encouraging trend in rational prescription practices, with over 94% compliance across most format and completeness parameters. Future audits should be expanded to incorporate WHO patient care and facility metrics in order to improve overall quality of care and gain a more thorough understanding of drug use practices.

Keywords: Prescription audit, World Health Organization, prescribing trends, rational drug use

Introduction:

A prescription audit is defined as "a part of the holistic clinical audit and is a quality improvement process that seeks to improve patient care and outcomes through a systematic review of care against explicit criteria and the implementation of change." It is a quality improvement process to improve patient care.[1] Effective healthcare delivery is based on the prudent use of pharmaceuticals, especially in tertiary care hospitals where patient loads and case complexity are much higher. In order to maximize patient outcomes and reduce the risk of adverse drug reactions (ADRs) and medication errors, prescription audits are essential for evaluating prescribing trends and guaranteeing adherence to established treatment guidelines.[2]

According to estimates, half of all patients do not take their medications as directed, and more than half of all medications are prescribed, distributed, or sold improperly worldwide. The most common concerns observed are: poly-pharmacy, inadequate dosage, misuse of antibiotics, excessive use of injections particularly when oral formulations are available, self-medication and non-compliance to treatment.[3] A multicentric study by Rational Use of Medicines Centers-Indian Council of Medical Research network under National Virtual Centre Clinical Pharmacology activity reported that most of the parameters in the present study were out of the range of WHO-recommended prescribing indicators.[4]

Prescription auditing is a crucial tool for preventing drug abuse and promoting more responsible drug use. Prescription audits, if conducted on a regular basis, can help improve the quality of prescriptions, allowing patients to receive the highest quality care possible. They can also help reduce adverse drug events, hospital stays, morbidity, and mortality, which will lessen the overall burden on the community and healthcare system.[5] The art of writing of a prescription plays an important role in the health-care system of the country. Prescribing errors may include omitting the dosage form, incorrect dosage, frequency, duration, specific instructions, and cautions, as well as failing to notify the patient about follow-up or the needed investigations prior to follow-up. Additionally, mistakes and errors of prescribing too many medications and misuse of antibiotics.[6] Although there have been similar studies done in India before, however they are limited owing to the small sample size.[4]

Regular institutional audits are a useful tool for tracking, analysing, and assessing issues. They also help to find gaps in medical practitioners' prescribing procedures and recommend suitable changes to streamline and reduce the cost of medical care. It also guarantees that patients receive high-quality, affordable, and equitable treatment. Because the first step in delivering high-quality, high-standard care is prescription audit. Also, prescription writing is one of the certifiable skill now and hence an educational activity. Incorrect prescriptions can lead to medicolegal problems. Writing a correct, rational, legible, and complete prescription is of utmost importance. So this study was taken up to audit the quality of outpatient department prescription at our hospital for completeness, legibility and against World Health Organization (WHO) recommended core prescribing indicators.

Materials and Methods:

Study design: It is an observational and cross-sectional study

Study duration: From December 2023 to Feb 2024

Source of Data: Scanned copies of all the prescriptions coming from OPDs of all departments irrespective of patient characteristics and department are collected during December 2023 to February 2024 from the two drug distribution centres of District Head Quarter Hospital & Shri Jagannath Medical college and Hospital (SJ MCH), Puri for analysis.

Permission: It was obtained from the Medical Superintendent of SJMCH, Puri on 12.09.2023

Ethical Clearance: It was obtained from Institutional Ethical Committee of SJMCH, Puri. Ref No. 52/ IEC SJMCH, dated 17.10.2023.

Sample size: The sample size calculator of prescription audit of Prescription Audit Guidelines of National Health Mission(2019) is used with margin of error (-10%) and Confidence Level (95%). The sample prescription selected for audit should be representative of the total OPD attendance. As the footfall of OPD admission was 3000 patients per day, 94 representative sample prescription per day was selected, which when calculated for 3 months from December 2023 to February 2024 is

calculated to about 8460 number of prescriptions. Our value is slightly larger than 8460 prescription and a sample size of 8844 number of prescriptions are analysed.
Analysis of the prescriptions was done according to 24 parameters in prescription audit checklist. The parameters are as follows

I. Format, its completeness.
II. Legibility
III. WHO core prescribing indicators?

Prescription audit and its completeness with regards to

Prescription Audit checklist	
I.	**Format regarding its completeness**
A	**Patient identification**
1	Name
2	Age
3	Sex
4	Weight
5	Address
6	Reported allergy
B	**Prescriber identification**
7	Doctor's name
8	Department
9	Hospital Registration Number
10	Date
11	Physician's initials
12	Physicians, registration number
13	Drug strength
14	Dose of drug
15	Dosage form
16	Duration of treatment
17	Directions for administration
18	Follow up advice
19	Allergy status, Contraindications
I.20	**Legibility of Prescription**
	Grade 1
	Grade 2
	Grade 3
I.	**WHO core prescribing indicators**
21	Average number of drugs per prescription
22	Percentage of drugs prescribed by generic name
23	Percentage of antibiotics per prescription
24	Percentage of injections per prescription
25	Percentage of drugs prescribed from the Essential Drugs List.

1. **I)Prescription format and its completeness with regards to**

1. Patient identifications (name, age, sex, weight, address)
2. Prescriber identification (name, department, hospital, registration number, physician initials)
3. Writing (start date, strength/dose/product formulation)
4. Dosing (under-dosing and overdosing)
5. Duration of treatment
6. Directions for administration
7. Follow up advice

8.Allergy status
9.Diagnosis

II) Legibility of prescriptions(4)**:** Prescription legibility was graded on a subjective scale by two independent investigators. Prescriptions were graded as:
Grade 1 (legible with ease)
Grade 2 (legible with difficulty)
Grade 3 (illegible).

In case of discrepancy between the grading of two investigators, opinion of a third investigator was sought.

III) WHO core prescribing indicators which includes (5)
1. Average number of drugs per prescription – Fixed dose combinations were also counted as one drug
2. Percentage of drugs prescribed by generic name
3.Percentage of antibiotics per prescription– antibiotics were classified based on the WHO model list for antibiotic classification and included penicillin, other antibiotics, anti-infective dermatological drugs, anti-infective ophthalmological agents and anti-diarrhoeal drugs or their combinations
4.Percentage of injections per prescription – vaccinations were excluded from this list
5.Percentage of drugs prescribed from the Essential Drugs List.

Statistical Analysis: The results were analyzed using descriptive statistics and presented as percentage and proportions. A p value < 0.05 was regarded as statistically significant. SPSS version 23.0 was used for analysis.

Results
A total of 8844 prescriptions were analysed for compliance. After analysing the prescription most of the parameters show greater than 94% compliance. The details of percentage of compliance regarding name, age, sex, address, weight, OPD Reg. no, date, department, physician's name, physician's initial, physician Regd no, drug strength and starting date are mentioned in Table 1.

1. Analysis of Prescription Audit Parameters

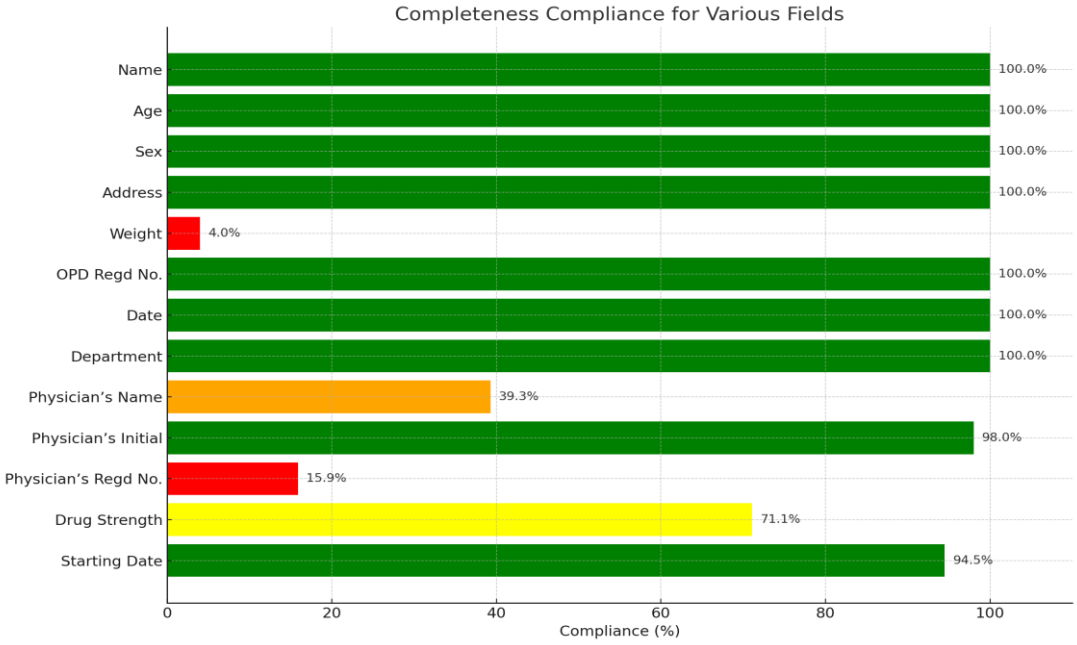

Table 1- Analysis of Prescription Audit Parameters

The bar colors represent the compliance level — green (excellent), yellow (moderate), orange (poor), and red (very poor).

2. Analysis of the prescription

The percentage compliance of details of the legibility of the prescription containing information such as dose of medication, product formulation, duration of treatment, direction for administration, follow-up advice, allergy and diagnosis. The details regarding legibility of the prescription is shown in Table 2.

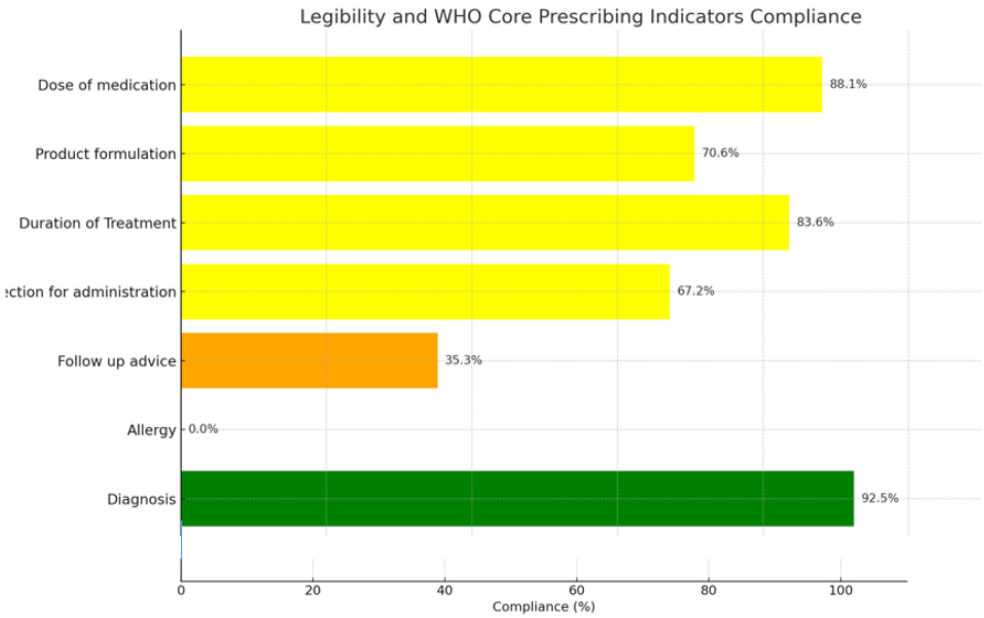

Table 2- Analysis of the prescription

The bar colors represent the compliance level — green (excellent), yellow (moderate) and orange (poor)

3. WHO core Prescribing indicators

The details of WHO core prescribing indicators is shown in Figure 1

WHO Core Prescribing Indicators

Indicator	Average / Percentage
Average number of drugs per prescrip	3.99
Percentage of drugs prescribed by generic	92.9%
Percentage of antibiotics per prescriptio	17.1%
Percentage of injections per prescription	5.68%
Percentage of drugs from the Essential Drug Lst (EDL)	90.9%

Fig 1- WHO core prescribing indicators

4. Legibility of the prescription

Legibility of a prescription was classified as Grade1,2 and 3. Grade 1 is Legible with Ease, Grade 2 is Legible with difficulty and Grade 3 is illegible. The details are shown in Figure 2.

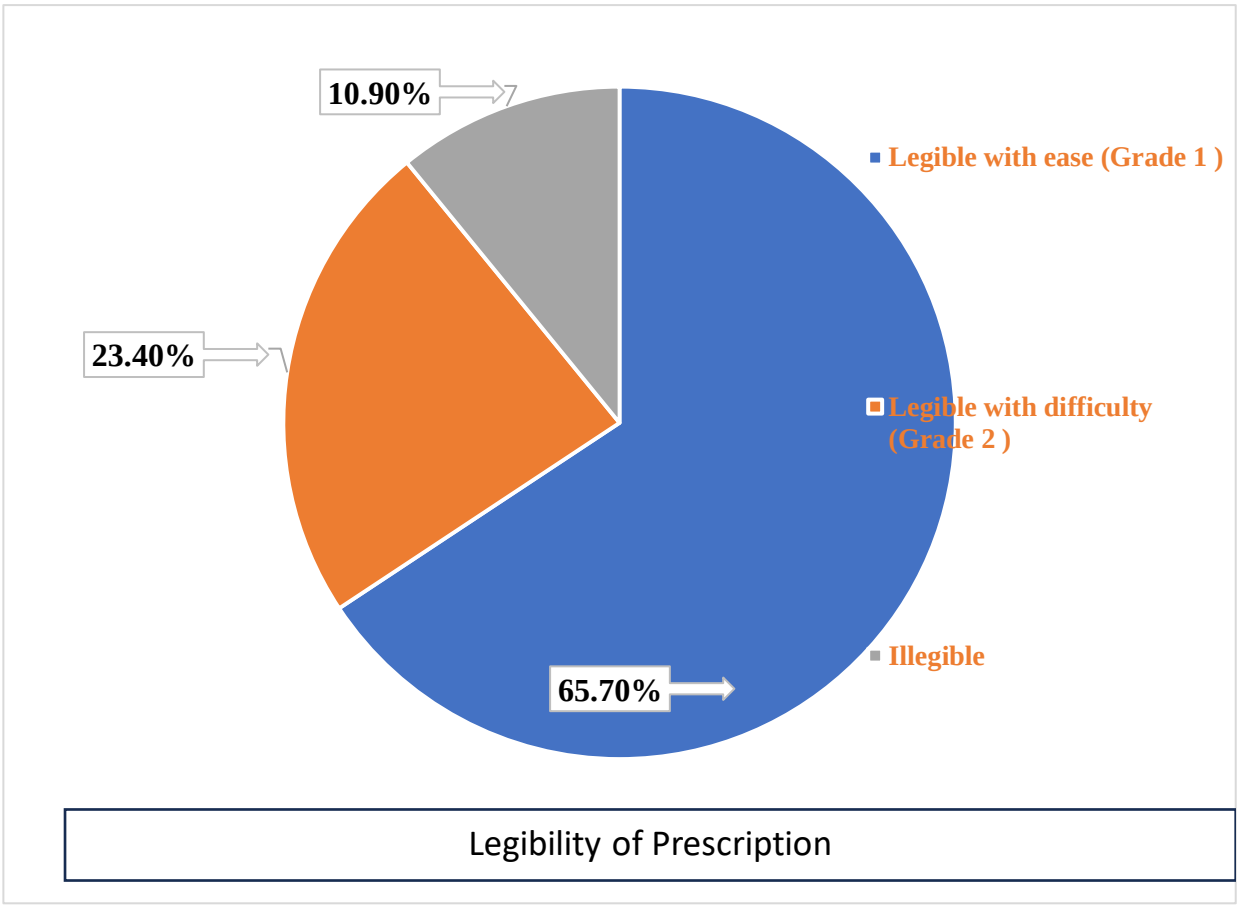

Figure 2- Legibility of prescription

5. Factors Contributing to Irrational Prescribing

These are the factors enlisted in Table 3 which are responsible for irrational prescribing

Category	Subcategory	Contributing Factors
Healthcare Provider Related Factors	Skills	Lack of training/workshops COVID-related disruptions Heavy patient load
Healthcare Provider Related Factors	Attitude	Avoid overcrowding Unaware of drug options Carelessness, lack of responsibility
Healthcare Provider Related Factors	Knowledge	Not following prescription guidelines Few seminars or CMEs Inexperience
Administrative/External Factors	Logistics	Poor equipment and maintenance Inadequate size of prescription space Drug unavailability at OPD
Administrative/External Factors	Monitoring	Irregular audits Poor update of drug availability
Administrative/External Factors	Administration	Fewer staff Inefficient duty schedules Lack of internal quality improvement

Table 3- Factors responsible for irrational prescribing

Discussion

The process of drug utilization in the outpatient setting is considered a multifaceted approach of the prescriber, the patient, and the pharmacist.[4] The prescription pattern of the tertiary care teaching hospital's outpatient department showed a high degree of compliance regarding the legibility of the prescription with the majority of requirements, surpassing 94% as specified in the results. Prescription errors are defined as those related to the act of writing a prescription.[7] These are in accordance to the WHO prescription legibility guidelines. Prescription legibility is a crucial factor in patient safety. This is of utmost essence as prescribing errors or an illegible prescription leads to 70% of all medication errors.[5]

The prescription was analyzed using the WHO core indicators. These indicators stipulate that the average number of medicines per encounter should be between 1.6-1.8, percentage of medicines prescribed by generic name should be 100%, Percentage of encounters with an antibiotic prescribed should be around 20-26%, percentage of prescription with injection should be 13-24% and 100% of the drugs should be from EML. WHO core indicators offer a uniform framework for assessing rationale drug use.[8]

In the current study, the average number of prescription was reported to be too high at 3.99 and is not accordance with the WHO core indicators. The high number of drugs per prescription could be owing to the demographic and epidemiological needs of the particular area. However, polypharmacy is a rather common occurrence in inpatient settings. The excessive number of prescription medications raises the risk of drug-drug interactions, increases the incidence of drug-related side effects, and drives up therapeutic costs. A committee comprising of pharmacologists and pharmacists should be created to reduce this. Each member of the team should contribute to lowering medication use and tracking drug effects to improve medication safety.[9]

The percentage of prescription with generic name was 93% which is close to the WHO standard, which stipulates that all the prescriptions should be in a generic name.[8] This is a much higher than the prescription pattern studies done in other Asian countries such as Pakistan (71.6%), Nepal (59.02%), and Jordan (57.6%).[10,11,12] However, this is very similar to the Indian data which reported 97% prescriptions with generic name.[13] The percentage of prescriptions containing antibiotic was 17% which is again in accordance to WHO standards. These findings are similar to another study which reported only 6% of the prescriptions containing antibiotics.[14] The percentage of prescriptions containing injections was 5.68% which is better than the average as indicated per WHO core indicators. Another study conducted for evaluation of drug prescription pattern noted that the use of injection was 3.1% which is similar to the current study.[15] A lower rate of injection use indicated a lower risk of infection. The percentage of drugs from EDL was 90% which although do not meet the criteria of 100%, but is still acceptable. These is still higher than what was observed in prescription pattern studies in other Asian countries such as Nepal and Bangladesh.[16,17]

Limitations

The study only included the prescription pattern. It did not include the patient care indicators and health facility indicators which are also drug use indicators as established by WHO. However, going ahead these indicators would also be included in the analysis as it would provide a more holistic approach to the drug utilization study.

Conclusion

This prescription audit conducted in the outpatient department of a tertiary care teaching hospital in Odisha reveals an encouraging trend in rational prescription practices, with over 94% compliance across most format and completeness parameters. The legibility of prescriptions was largely acceptable, which is crucial for patient safety and preventing medication errors. This study also shows a solid foundation of reasonable prescribing procedures in the organization, even though there are a few areas that require improvement, especially when it comes to polypharmacy. Future audits should be expanded to incorporate WHO patient care and facility metrics in order to improve overall quality of care and gain a more thorough understanding of drug use practices.

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