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A RETROSPECTIVE PRESCRIPTION AUDIT STUDY IN OUT PATIENT DEPARTMENT OF A TERTIARY CARE HOSPITAL IN SOUTHERN RAJASTHAN

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ABSTRACT: Background: Prescription audit is an effective way to raise the standard of prescriptions. WHO core prescribing indicators are established and trustworthy tool for assessing the quality of prescriptions. So, we used WHO-recommended core prescribing indicators to assess the prescription pattern of treating physicians. **Methods:** A retrospective observational study was done. A total of 632 prescriptions were included with 2002 drugs from general medicine OPD. The prescriptions were analyzed for general details, legibility, rationality, and WHO core prescribing indicators. The data obtained were presented as descriptive statistics by using MS-Excel and SPSS ver.24. **Results:** All the prescriptions had general details mentioned as pre-printed. The average number of drugs per encounter was 3.17 ± 1.64 and only 461 (23.03 %) of the drugs were prescribed by generic name. The percentage of encounters prescribed with an antibiotic 160 (25.3%) and an injection 164 (25.9%) was observed. A total 1767 out of 2002 (88.3%) of the drugs were prescribed by the NLEM. Prescriptions with diagnosis (77%), signed (83.07%), and 61.07% with legible handwriting noted. The prescriptions advised 60.4 % of investigations and 41% of multivitamins. **Conclusion:** Percentage of prescriptions with an antibiotic was within limits as recommended by WHO. This shows rational antibiotic prescribing practices are followed. However, the average number of drugs per encounter was slightly high, and less number of drugs were prescribed in the generic name. For this, Prescription auditing and awareness should be done regularly, and physicians should improve their prescription writing skills for the benefit of their patients.

INTRODUCTION: A prescription for a drug is a medico-legal document that demonstrates the doctor's professionalism and attitude towards reasonable prescribing. It is one of the systematic, critical analyses of the quality of medical care, including the methods used for diagnosis and treatment, the use of resources, outcome, and quality of life for the patients [1]. It serves as a standard for comparison with subsequent audits.

Prescription audit is a continuous cycle that involves observing practice, setting standards, comparing practice to standards, implementing changes, and observing new practice. Prescription mistakes could result in severe adverse drug reactions and medication errors [2].

Adverse drug reactions (ADRs) and medication errors can result from improper prescribing, which increases patient morbidity and death [3]. According to the World Health Organization (WHO), patients must receive medication that is appropriate for their clinical needs, in doses that meet their individual needs, for an adequate amount of time and at an affordable cost for both them and their community [4].

To better understand general medicines prescribing patterns, the WHO and the International Network for Rational Use of Drugs created a collection of "core drug use indicators". Main aim of these indicators is to study the rational use of drugs. The metrics track progress in three interconnected areas: patient care, prescribing procedures, and facility-specific elements. The fundamental drug use indicators are now acknowledged as unbiased measurements that characterize the drug use situation in a nation, region or health facility. The number of medications prescribed per encounter, the proportion of medications prescribed by generic names, the proportion of encounters involving injections, the prescription of antibiotics and the proportion of medications prescribed from the essential drug list are all examples of prescribing indicators [5].

Our institution is a tertiary care hospital that meets the health needs of most of the population around Udaipur, Rajsamand and some of the southern part of Rajasthan. As regular prescription auditing has not been undertaken at this institution earlier, this study serves as a tool to evaluate the prescribing practices and an attempt to optimize and rationalize health care. So, we designed this study to assess the rational prescription pattern by measuring the WHO Core Prescribing Indicators and to assess the quality of prescriptions at the General Medicine department. Through this study, we aim to extend awareness about the significance of rational prescribing and the role of prescription audit.

MATERIALS AND METHODS: After approval from the Institutional Ethics committee (AIMS/IEC/2022/027 dated: 20-06-2022), a record-based, retrospective, observational study was conducted at a tertiary care center of southern Rajasthan. The study was done for 3 months from July 2022 to September 2022. We obtained data (prescriptions) of General medicine OPD from the institution's MRD (medical record department). Prescriptions from IPD, neonates, with insufficient data and prescriptions without drugs were excluded from the study. Prescriptions of General medicine OPD irrespective of age group (except neonates), gender (both male and female), characteristics, diagnosis and treatment were included in the study. Initially, 671 prescriptions were collected randomly; after exclusion total 632 prescriptions

were included in the study for audit. The sample size was based on the WHO "How to investigate drug use in health facilities" document which recommends at least 600 prescription encounters to assess drug use pattern in health facilities [5]. The prescribing encounters included only the prescriptions from the general medicine OPD to rule out the varied treatment practices from other departments. This was to ensure targeted follow-up investigation of the specific treatment practice to be done in case of a drug use indicator issue. The WHO guidelines and methods were observed to ensure data reliability [5]. Data from the prescriptions were recorded in the data collection forms.

All the prescriptions were analyzed on the following parameters:

Prescription format and its completeness concerning:

General details (name, age, sex, OPD registration number, weight, height, and date of consultation)

Indicators for Legibility and Rationality of the Prescription:

❖ Percentage of prescriptions with legible handwriting.

❖ Percentage of prescriptions where allergies are mentioned.

❖ Percentage of prescriptions with brief history written.

❖ Percentage of prescriptions with provisional or Final Diagnosis

❖ Percentage of prescriptions where salient features of clinical examination are recorded.

❖ Percentage of prescriptions where schedule/Dosages were written.

❖ Percentage of prescriptions with Vitamins, Tonics, or Enzymes.

❖ Percentage of prescription with investigations, do's and don'ts, follow-up advice, referral details , duration of treatment and further review date written.

❖ Percentage of prescriptions duly signed by registered practitioner.

❖ The WHO core drug use indicators [5] are very important for the assessment of the quality of prescription. It includes three groups: Prescribing indicators, Patient-care indicators and Health facility indicators. In this study, apart from the general details and medical components mentioned above, we used WHO core drug use prescribing indicators for prescription audit. These are:

Average Number of Drugs Prescribed per Encounter: The average is calculated by dividing the total number of drugs prescribed by the total number of encounters sampled. It was calculated to measure the degree of poly-pharmacy.

Percentage of Drugs Prescribed by Generic Name = (Number of drugs prescribed by generic name / Total number of drugs prescribed) ×100

Percentage of encounters with an antibiotic prescribed= (Number of patient encounters with an antibiotic / Total number of encounters sampled) × 100

Percentage of encounters with an injection prescribed = (Number of patient encounters with an injection prescribed / Total number of encounters sampled) × 100

Percentage of drugs prescribed from NLEM/ EDL = (Number of drugs prescribed from essential drug list / Total number of prescribed drugs) × 100

The prescription audit also included the completeness and legibility of the prescriptions along with core prescribing indicators to cover all the aspects involved in the overall appropriateness of the prescribing performance of the physicians.

EDL (essential drug list), Rajasthan/NLEM (National List of Essential Medicines), and WHO drug prescribing indicators were used as resource materials. Data collected were entered in Microsoft Excel, and analysis was performed using the Statistical Package for the Social Sciences (SPSS Statistics for Windows, version 24. Armonk, NY, USA: IBM Corp). Descriptive statistical analyses such as percentages, mean, and standard deviation were used to present the data.

RESULTS: After exclusion, 632 OPD prescription papers were assessed. Among them, 240 (38%) male and 392 (62.02 %) were female patients. The patient's complete name, age, date of consultation and OPD registration number were present in 100% of prescriptions, as it was preprinted. The weight and height of patient were mentioned in only 127 (20%) prescriptions. Legible handwriting was seen in 386 (61.07%) of total assessed prescriptions, presumptive/definitive diagnosis was written in 484 (77%), brief history was written in 398 (63%), allergy status of patient was mentioned in only 26 (4.11%) prescriptions, salient features of clinical examination was noted in 317 (50.16%) and investigations were advised in 382 (60.4%) of total assessed prescriptions.

Dosage schedule/doses were written in 455 (72%) prescriptions. The duration of treatment was written in 253 (40%). Date of the next visit (review) was written in 26 (4.11%). In the case of referral, the relevant clinical details and reason for referral were given in 19 (3%). The required precautions/do's and don'ts recorded in 49(7.75%) prescriptions. Prescription duly signed and the name was written (legibly)/stamped in 525 (83.07%). Prescriptions with at least one vitamins, tonic or enzymes advised were 258 (41%) **Table 2.**

A total of 2002 drugs were prescribed in 632 prescriptions. The WHO core prescribing indicators analysis revealed that the average number of drugs per encounter was 3.17 ± 1.64. The percentage of drugs prescribed by generic name was 461 (23.03%). Prescriptions with at least one generic drug was 153 (24.02%). Around 25.3 % (160 out of 632) prescriptions contained at least an antibiotic, and 268 (13.38%) prescribed drugs were antibiotics. Out of 632 total 164 (25.9%) prescriptions contained at least one injectable preparation and 12.63 % of total drugs (253 out of 2002) were in injectable form. In this study, approximately 82.3% of prescriptions (520 out of 632) contained at least one drug from either NLEM or EDL (Rajasthan), and total 1767 (88.3%) out of 2002 drugs were prescribed from NLEM or EDL (Rajasthan).

TABLE 1: DEMOGRAPHIC PROFILE OF PATIENTS

Sex	Frequency (n)	Percentage (%)
Male	240	38 %
Female	392	62.02 %
Total	632	100 %

TABLE 2: COMPLETENESS OF PRESCRIPTIONS IN RELATION TO LEGIBILITY AND RATIONALITY OF THE PRESCRIPTION

Parameters	Frequency (n)	Percentage (%)
Legible handwriting present	386	61.07%
Patient history present	398	63%
Allergy status mentioned	26	4.11%
Salient features of clinical examination mentioned	317	50.16%
Provisional or Final Diagnosis mentioned	484	77%
Schedule/Dosages were written	455	72%
Duration of treatment written	253	40%
Patient advice (do's and don'ts) written	49	7.75%
Review date written	26	4.11%
Referral details mentioned	19	3%
Prescriptions duly signed	525	83.07%
Prescription with investigations	382	60.4%
Prescription with Vitamins, Tonics, or Enzymes	258	41%

TABLE 3: COMPARISON OF WHO CORE DRUG USE PRESCRIBING INDICATORS

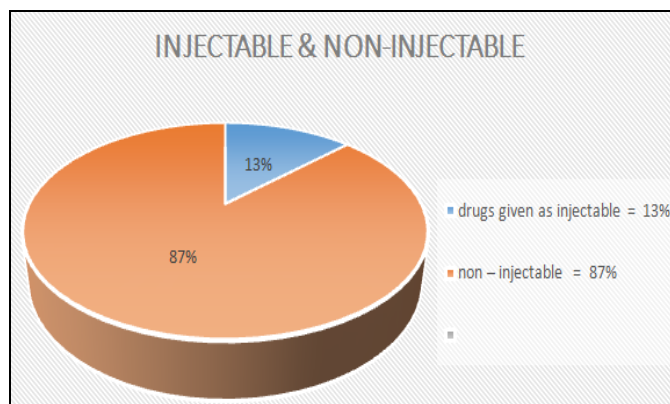| WHO Core Prescribing Indicators	Value obtained in the audit	Desirable value
Average number of drugs per encounter	3.17 ± 1.64	1.6-1.8
Percentage of drugs prescribed by generic name	23.03%	100%
Percentage of encounters with an antibiotic prescribed	25.3%	20-26.8%
Percentage of encounters with an injection prescribed	25.9 %	13.4-24.1%
Percentage of drugs prescribed from essential drugs list	88.3%	100%
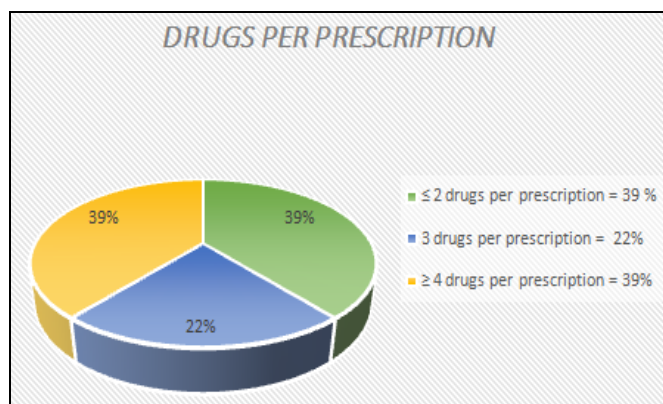
FIG. 1: DRUGS PER PRESCRIPTION

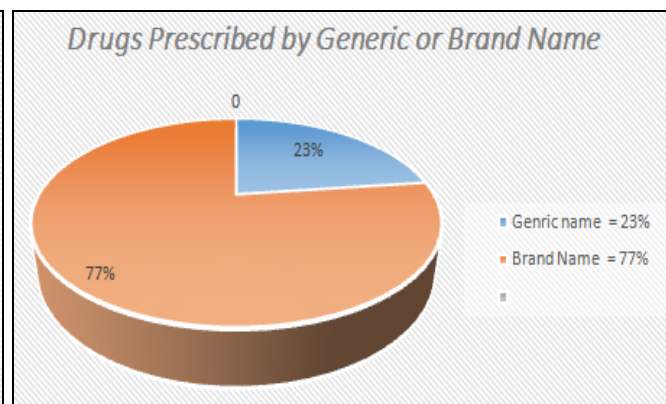**FIG. 2: DRUGS PRESCRIBED BY INJECTABLE & NON INJECTABLE**

FIG. 3: DRUGS PRESCRIBED BY GENERIC OR BRAND NAME

DISCUSSION: Our study was conducted at a southern Rajasthan tertiary care hospital. Based on the WHO core prescribing indicators, a total of 671 prescriptions were analyzed. After exclusion, a total 632 prescriptions were included in the study. We found a higher percentage of female patients (62.02%) compared to males (38%). Some researchers [6, 7] also found the majority of female

patients, however in some studies [8] more male patients were there. In our study, all of the prescriptions contained the name, sex, OPD registration no, age and date because they were all computer-generated. Similar results were found in some other studies also [9, 10]. In a study of Ethiopian Teaching Hospital [11], it was observed that age, gender and OPD numbers were not recorded in 36.6%, 16.8% and 12.4% of the prescriptions respectively due to handwritten OPD tickets. This variation could be attributed to the type of registration system used, as our institute uses a centralized computer registration system that produces good results. This distinction emphasizes the superiority of computer-generated tickets over handwritten tickets. Incorrect prescriptions and administration are avoided by providing complete patient identification information. There is a lot of evidence from around the world that poor-quality prescription writing increases the risk of serious medication errors. In addition, the patient's age could be used as a guide to ensure that the appropriate dose of the drug is dispensed [12].

Only 20% of prescriptions in our study have patient's body weight and height, which is marginally better than the some studies [9, 12, 13, 14], where only 13.5%, 1.1%, 12.4% and 8.4% of prescriptions contained body weight of the patients. We found that the patient's allergy status was mentioned in only 4.11%, 50.16% had proper clinical examination mentioned, 60.4% of prescriptions had any investigation advised by prescribers and 63% had proper patient history. Our results are consistent with some previous work published [15, 16]. In one study from Haryana, India [9] stated that none of the prescriptions mentioned the patient's allergy. The reasons could be a high OPD load, nonspecific complaints, or doctors communicating verbally rather than writing in detail.

Rational prescribing means the drugs should be given for proper indication, in the proper dose frequency, for the proper duration and through the proper route. For the analysis of the rationality of the prescriptions. All prescriptions should have all the relevant information mentioned, including the diagnosis, name of the drug, dosage, route, frequency, and duration of therapy. In our study, 77% of prescriptions had the correct diagnosis specified, similar to the results of the study by some scientists [12, 17], where they mentioned diagnosis 61.3% and 82.7%, respectively. Proper diagnosis is important because if it is not there, it could make the follow-up confusing, especially if the patient changes their doctor.

In our study, we found that the drug name was mentioned in all the included prescriptions. However, only 72% had the dosing or proper schedule mentioned and duration of treatment was given in only 40% of cases. This is almost comparable with previous studies done [9, 13, 18] but, in one study from Dilla University, Ethiopia [19] found 93.10% of prescriptions mentioned proper route of administration with correct dose and duration in 94.98% and 73.72%, which is much higher than what we found. It is required that every prescription should bear the full signature of the prescriber and if initials are given instead of the full signature at least a stamp that must be given having the full name of the prescriber. This is very important for future reference and to clear any confusion regarding the treatment. In our study we found 83.07% prescriptions had full signatures and details of prescribers which is better than some studies [9, 13] who found only 12% and 46.9% prescriptions, respectively and lesser than one study [14] who found 98.9% of prescriptions, respectively. In another study [15] the prescribing doctor's signature or initials were legible in 65.8% of the prescriptions and doctor's registration number was mentioned in only 3.3% of prescriptions. These details are necessary for identifying the prescribing doctor and validating prescription authenticity.

In our study we found that advice for patient (do's & don'ts), further follow-up date and referral details were mentioned in 7.75%, 4.11% and 3 % of total prescriptions. Similar results were found by some researchers [15, 16]. In contrast to our study, one researcher [17] found almost 98.2% of the prescriptions had follow-up advice and another study [7] mentioned 81% prescriptions had review date. Follow-up advice is critical for facilitating treatment continuation and changing treatments as needed. We found that 60.4 % of prescriptions had investigations written by physicians, similarly results were found by some researchers [10, 15] where 59.7% and 63.87% investigations advised in their

studies. Further, we found 41 % prescriptions had at least one vitamin supplement, tonic or enzymes mentioned which is in accordance of some previous work [6]. In contrast, one study [12] found only 4.77% vitamins and minerals prescribed.

The completeness and rationality of the prescriptions was further evaluated by assessing the legible hand writing of physicians. More than half of the prescriptions (61.07%) of our study were written by physicians with legible hand writing. Similar results were found by some scientists [7, 9, 20]. In contrast, some researchers [10, 15] found 93.7% and 85% prescriptions with legible handwriting. To avoid such errors, capital letters should be encouraged when prescribing drugs and if possible, switching to an electronic prescribing system is much better.

In continuation of the above parameters, we used standard WHO core drug prescribing indicators to assess the quality of prescriptions. First indicator is average number of drugs per encounter which also shows degree of polypharmacy. We found average 3.17 ± 1.64 drugs being prescribed per prescription which is more than WHO recommendations (1.6-1.8). Our results are comparable to some studies [7, 6, 13, 21] they found 5.6, 4.37, 4.12 and 3.4 average drugs per prescription respectively. However, some studies [17, 22, 10, 19] like 2.38, 2.23, 2.1 and 1.8 showed better results. Increasing the number of drugs per prescription raises the cost of the prescription, resulting in an economic burden, non-adherence to therapy, an increase in drug-drug and drug-food interactions, all of which worsen the condition and lengthen the treatment. However, after analyzing the diagnosis for which the drugs were prescribed in our study, we discovered that the majority of the prescriptions with more drugs were written for patients with multiple diseases or elderly patients with multiple co-morbid conditions. It could be a reason for poly-pharmacy.

Recently the Government of India have framed rules to prescribe medicines in generic name. Prescribing drugs by generic name promotes rational use of drugs with regard to safety, efficacy, and cost by permitting identification of the products by its scientific names. Generic prescribing not only rationalizes but also decreases the cost of therapy to a great extent. It also reduces the chances of dispensing errors which may be due to misinterpretation of sound-alike trade names of drugs [23]. Among the total number of drugs prescribed, we found only 23.03% of drugs prescribed in generic name, comparable to the results obtained in another study from India [3] (29.4%). Some studies [10, 8, 22] showed a significantly lower percentage of drugs with generic name as compared to WHO recommended value (100%) like 1.63%, 3.6% and 11.3%, respectively. On the other hand, some studies [13, 24, 15, 10] showed better results like 78.2%, 89.88%, 85.8% and 89.55% of drugs prescribed by generic names. These findings demonstrate that significant gaps remain despite the recent emphasis on generic prescription. A low percentage of generic medications may indicate medicine shortages, a lack of trust in generic medications, or patients' preference for branded products [25].

Antimicrobials should be rational, as irrational use may lead to the emergence of antimicrobial drug resistance, increased adverse reactions, and unnecessary hospital admissions. Superinfection is also a potential possibility with overprescribing of antimicrobials [21]. Over-prescribing antibiotics by health workers can lead to resistance and an increased financial burden on the patient [10]. We found 25.3% (WHO recommended value 20-25.4%) of encounters containing antibiotics. Similar results found by some researchers [24, 13, 26] like 24.27%, 19.4% and 36.6%. Some studies [19, 10, 20, 15] showed antibiotic usage in 77.25%, 74.12%, 55.4% and 52.5% of prescriptions, respectively, which are much higher than our findings. Our study results show encouraging trend regarding antibiotic usage that there is scope for betterment. One major step towards rational antibiotic use in institutions is the ongoing antibiotic stewardship program and awareness of treating physicians.

We found 25.9% encounter with an injection prescribed in our study. These results are apparent as this hospital is a tertiary care center and a referral center that covers a larger population. Also, injectable drug formulations have a faster onset of action.

Other studies in tertiary care centers showed more tendency toward prescribing injectable drugs. For example, one researcher [24] found 24.05% of

encounters with injections in their study that can be explained by the fact that it was done on hospitalized patients in a tertiary care center. However, some studies [7, 8, 12, 13, 17] alsoshowed lower percentage of injections prescribed as compare to our results. This percentage could be greater if we included emergency department, ICU or IPD settings like a study done in Pakistan [27] they found 98% of prescriptions included at least one injectable preparation. Although excessive use of injections may lead to a higher probability of blood borne diseases, injections are always more costly than oral formulations.

Compared with desirable values given by WHO (100%), we found 88.3 % of drugs prescribed from the essential drug list of either state (Rajasthan) or EDL/NLEM of India. Similar results found in some studies [16, 17, 19, 12] like 77%, 88%, 97.43% and 100%. Apart from it, some researchers like [7, 22] found 26% and 57% drugs from NLEM respectively. National list of Essential Medicine should be updated periodically and readily available to all Physicians as drug prescribed by NLEM avoid unnecessary economic burden [28]. In addition to the above indicators, we can include health facility indicators, different departments and various institutions. Prescription audits performed at various institution levels would aid in comparing drug use patterns and providing recommendations to improve prescribing behavior across the institutes.

CONCLUSION: Based on the results of this study, the percentage of antibiotic encounters stayed within WHO guidelines. This demonstrates that rational antibiotic prescribing practices are followed as a result of the antibiotic stewardship program. The average number of drugs per encounter was slightly high and fewer drugs prescribed in generic name. Frequent practice of poly-pharmacy could result to serious ADRs and drug interactions.

So, auditing the appropriate use of drugs in the form of prescriptions is an urgent need. To avoid medication errors, the art of prescription writing should be included in the medical curriculum. There should be frequent seminars and CMEs to raise awareness of medication errors and the importance of prescription auditing.

REFERENCES:

1. Bandyopadhyay D: A study of prescription auditing in a Tertiary Care Teaching Hospital of Eastern India. Journal of Drug Delivery and Therapeutics 2014; 4(1): 140-9.
2. Megha MA, Shantanu MD, Shruti MP, Asmita S, Komal N and Pratik S: A study of prescription audit in inpatient department of tertiary care hospital, Pune. Indo American Journal of Pharmaceutical Sciences 2018; 5: 335-341.
3. Kumari K and Kumar P: Study of drug prescribing pattern in a Tertiary Care Hospital in Jharkhand. International Journal of Biomedical Research 2017; 8: 85-8.
4. World Health Organization (WHO). The World Medicines Situation. Geneva: World Health Organization Press. World Health Organization 2004.
5. World Health Organization. How to Investigate Drug Use in Health Facilities: Selected Drug Use Indicator. Geneva: World Health Organization/DAP/93.1; 1993.
6. Batta A, Madan N, Kalra BS and Arora S: Prescription audit, drug utilization pattern and adverse drug reaction monitoring in outpatients of orthopedics department of tertiary care teaching hospital: a pilot study. MAMC Journal of Medical Sciences 2019; 5: 77-82.
7. Dhanya TH, Sanalkumar KB and Andrews MA: Prescription auditing based on the world health organization (WHO) prescribing indicators in outpatient department of a teaching hospital in Kerala. Asian J of Pharma and Clinical Research 2021; 14(5): 147-151.
8. Sunny D, Roy K, Benny SS, Mathew DC, Naik GJ and Gauthaman K: Prescription Audit in an Outpatient Pharmacy of a Tertiary Care Teaching Hospital-A Prospective Study. Journal of Young Pharmacists 2019; 11(4): 417-20.
9. Sharma M, Payal N, Devi LS, Gautam D, Khandait M, Hazarika K and Sardar M: Study on Prescription Audit from a Rural Tertiary Care Hospital in North India. Journal of Pure and Applied Microbiology 2021; 15(4): 1931-1939. doi: 10.22207/JPAM.15.4.14
10. Mercy M and Antony JL: A prescription audit using the WHO core drug use indicators in a Rural Health Training Center of Pondicherry. CHRISMED Journal of Health and Research 2022; 9: 183-7.
11. Desta Z and Abdulwhab M: Prescription writing in Gondar outpatient teaching hospital, Ethiopia. East African Medical Journal 1996 Feb; 73(2): 115-119.
12. Mengistu G, Misganaw D, Tsehay T, Alemu KB and Bogale K: Assessment of Drug Use Pattern Using WHO Core Prescribing Indicators at Outpatient Settings of Governmental Hospitals in Dessie Town. Drug Healthcare and Patient Safety 2020; 12: 237–244.
13. Halder SS, Gangopadhyay T, Mondal S and Das KA: Prescription audit from the outpatient department of a rural

hospital in West Bengal, India: a cross-sectional study. Asian Journal of Pharmaceutical and Clinical Research 2022; 15(12): 126-129.

14. Vigneshwaran E, Sadiq MJ and Prathima V: Assessment of completeness and legibility of prescriptions received at community pharmacies. Journal of Health Research and Review 2016; 3: 72-76. doi: 10.4103/2394-2010.184242.

15. Singh T, Banerjee B, Garg S and Sharma S: A prescription audit using the World Health Organization recommended core drug use indicators in a rural hospital of Delhi. Journal of Education and Health Promotion 2019; 8: 37.

16. Singh N, Varun N and Garg M: An audit of prescription forms of patients from obstetrics and gynecology clinics in tertiary care hospitals: An exploratory study. Indian Journal of Medical Specialties 2020; 11: 85-87.

17. Meenakshi R, Selvaraj N, Anandabaskar N, Dhamodharan A, Badrinath AK and Rajamohammad MA: Prescription audit of a teaching hospital in South India using World Health Organization core prescribing indicators – A cross-sectional study. Perspectives in Clinical Research 2022; 13: 132-136.

18. Weldemariam DG, Amaha ND, Abdu N and Tesfamariam EH: Assessment of completeness and legibility of handwritten prescriptions in six community chain pharmacies of Asmara, Eritrea: A cross-sectional study. BMC Health Services Research 2020; 20: 570.https://doi.org/10.1186/s12913-020-05418-9

19. Bekele NA and Tadesse J: Prescription auditing based on World Health Organization (WHO) prescribing indicators: A case of Dilla University Referral Hospital. Journal of Drug Delivery and Therapeutics 2018; 8: 21-25.

20. Hemangini RA, Manish JB, Narendra PP and Tripathi CB: Prescription audit in outpatient departments of a tertiary care teaching hospital: A cross-sectional study. European J of Pharmaceuticaland Medical Research 2017; 4: 372-379.

21. Rai S, Bhuvana K, Sowmya C, Sahana HV and Yaseen M: Prescription audit at a tertiary care teaching hospital.

22. Teja KN, Hazra P and Padma L: Audit of prescriptions from the department of general medicine based on the WHO core prescribing indicators at Sapthagiri hospital, Bangalore. International Journal of Basic and Clinical Pharmacology 2019; 8: 2759-62.

23. Balbir K and Rani W: Prescription audit for evaluation of prescribing pattern of the doctors for rational drug therapy in a tertiary care hospital. Journal of Drug Delivery and Therapeutics 2013; 3: 77-80.

24. Pathak A, Gupta VK, Maurya A, Kumar A and Singh A: Assessment of drug prescribing pattern using WHO indicators in hospitalized patients at a tertiary care teaching hospital in rural area of India. International Journal of Basic and Clinical Pharmacology 2016; 5: 651-655.

25. Ofori-Asenso R: A closer look at the World Health Organization's prescribing indicators. Journal of Pharmacology and Pharmacotherapeutics 2016; 7: 51-54.

26. Meena DK, Mathaiyan J, Thulasingam M and Ramasamy K: Assessment of medicine use based on WHO drug-use indicators in public health facilities of the South Indian Union Territory. British Journal of Clinical Pharmacology 2022; 88(5): 2315-2326. (https://doi.org/10.1111/bcp.15165)

27. Atif M, Sarwar MR, Azeem M, Umer D, Rauf A, Rasool A, Ahsan M and Scahill S: Assessment of WHO/INRUD core drug use indicators in two tertiary care hospitals of Bahawalpur, Punjab, Pakistan. Journal of Pharmaceutical Policy and Practice 2016; 9: 27.doi: 10.1186/s40545-016-0076-4

28. Saha A, Bhattacharjya H, Sengupta B and Debbarma R: Prescription audit in outpatient department of a teaching hospital of North East, India. International Journal of Research in Medical Sciences 2018; 6(4): 1241-1247.