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ASSESSMENT OF OPHTHALMIC DRUG USE AT BORU HOSPITAL (BH), DESSIE, NORTH EAST ETHIOPIA

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ABSTRACT: Background: Recently, in the discipline of ophthalmology, there have been many developments and introduction of new ocular therapeutic agents. To improve drugs therapeutic efficacy, minimize adverse effects, and delay development of resistance drug utilization trends and patients need to be evaluated periodically. **Objective:** To assess the prescribing, drug use, and to dispense practice of ophthalmic drugs at Boru hospital. **Methodology:** Cross-sectional study was conducted on patients attending outpatient department pharmacy of Boru Meda hospital to collect their medicines. Prescriptions of 84 patients encountered were analyzed using World Health Organization (WHO) prescribing indicators and additional indices. **Result:** Analysis showed that the mean number of drug per prescription was 2.2 and 97.2% of prescribed drugs were from the national essential drug list. 89.5% of drugs were prescribed by their generic name. Majority of the prescribed drugs were antibiotics (62.7%), and only 17.7% of the prescriptions had a frequency of dosing. Percentage of patients with good post-dispensing knowledge on the dispensed ophthalmic drugs was 37.1%. Dispensing and counseling time were 18sec and 1.30 minute, respectively. **Conclusion:** The study indicated an awareness of polypharmacy. But showed ample scope for improvement in encouraging the prescriber to write the complete prescription and the dispenser to provide adequate counseling.

Keywords: World health organization, Drug use evaluation, Ophthalmology, Boru hospital

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INTRODUCTION: The World Health Organization (WHO) has defined drug utilization research as the marketing, distribution, prescription and use of drugs in a society, with special emphasis on the resulting medical, social and economic consequences¹⁻³. It is an essential part of pharmacoepidemiology, which describes the extent nature and determinants of drug exposure with the ultimate goal to facilitate rational use of drugs in the population¹⁻⁴.

Eye care is one of the most sensible practices of the health care system. Irrational care of the eye could lead to from temporary vision loss to blindness⁹. Recently in the discipline of ophthalmology, there have been many developments and introduction of new ocular therapeutic agents⁵. Antibiotics are widely prescribed for various ophthalmic diseases. Evidence has shown resistance to a different class of antibiotics often used in ocular therapeutics⁶. Topical steroids were often irrationally used on a long term basis for quick relief from ocular discomfort of inflammatory eye conditions in spite of their well-known deleterious ocular effects⁶.

Indiscriminate use of topical antibiotics and Non-Steroidal Anti-Inflammatory Drugs (NSAIDs) cause histological and structural change in conjunctiva⁷.

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To improve drugs therapeutic efficacy, minimize adverse effects, and delay development of resistance drug utilization trends and patients need to be evaluated periodically⁸. Inappropriate and cost-ineffective uses of pharmaceuticals are worldwide phenomena, especially in developing countries. Drug utilization research may provide insights into different aspects of drug prescribing, including pattern, determinants, outcomes of drug use, and quality control cycle⁹.

A rational approach to therapeutics requires careful evaluation of the health problem and selecting appropriate therapeutic strategies. Making the right diagnosis is the cornerstone for choosing the right kind of therapy. The irrational use of drugs has become a serious problem in Ethiopia one of the causes of irrational drug use is the absence of Standard Treatment Guideline (STG) for the most common disease in the country¹⁰.

Hence, the current study was conducted to assess the prescribing, drug use, and dispensing practice of ophthalmic drugs at Boru hospital.

METHODS AND MATERIALS:

Study Setting and Period: The study was conducted at Boru hospital, which is found in South Wollo Zone Dessie town, Amhara regional state, Ethiopia. Boru Meda hospital provides service on ophthalmology, MDR TB, dermatological conditions, and other medical services. About 20-30 patients with ophthalmic case visit Boru hospital per day. The data collection was conducted from May 7 to June 7, 2015.

Study Design: A prospective cross-sectional observational study was conducted on Patients who were visiting the dispensing pharmacy unit with the ophthalmic case. The details of prescribed drugs were recorded, including its dosage form, route of administration, frequency of administration, indications, and duration of therapy. Patients knowledge of dispensed drugs was also assessed.

Sample Size Determination: Prescriptions of 84 patients treated during the study fulfilling the inclusion and exclusion criteria were audited prospectively using a specially designed case report form to record the required information from the outpatient department (OPD) prescription cards of each patient.

Eligibility Criteria: Prescriptions presented to the dispensary with the ophthalmic case were included. Patients with prescription of medical equipment and device, patients on follow up without drug prescription and Patients with comorbidities were exempted from the study.

Data Collection and Management: The data was collected from patients and caregivers who come to the pharmacy with the ophthalmic case using interview and data for assessments of prescribing and dispensing practice were collected using questionnaires and observation. The questionnaire was pre-tested on 5% of patients to see the soundness of the questionnaire and make the necessary correction before starting the study.

Data Analysis: The recorded data was then analyzed by the WHO core drug use prescribing indicators and additional indices.

WHO drug use indicators: average number of drugs per encounter, percentage of drugs prescribed by generic name, percentage of encounters with antibiotics prescribed, percentage of drugs prescribed from national essential drug list were analyzed

Additional Indices: dispensing time, counseling time and patient's knowledge were analyzed

Statistical Analysis: descriptive statistics were performed. Data were entered and analyzed with Microsoft Excel. Values were expressed as actual numbers, percentages, and mean.

Operational Definition:

- **Counseling Time:** A period during which the patients come to the dispensing counter to receive the prescribed medication and oral or written information about the prescribed medication and leave the dispensary.
- **Dispensing Time:** The time in which the prescribed item is prepared and dispensed to the patient.
- **Post-Dispensing Knowledge:** In this defined as good if patients were correct for five or more of the following interview

questions and poor if they were correct for less than five of those questions.

- Do you know for how long you are supposed to take the medication?
- Do you know how many times per day you are supposed to take the drug?
- Do you know the amount of dose you are supposed to use of the medication?
- Do you know how to administer the medication?
- Were you informed to close the tube soon after use?
- Were you informed well to use for an only infected eye?

Ethical Consideration: Ethical clearance was obtained from Wollo University College of Medicine and Health Sciences department of pharmacy. A full explanation about the purpose of the study was made to authorities of Hospitals and the participants. Data collection was conducted after approval of the study by concerned authorities. The respondents were informed of their right to refuse or agree to participate in the study. All participants were given oral informed consent before the start of the study. To assure confidentiality, participants were not be asked to identify them by name.

RESULTS:

Socio-demographic Characteristic of the Patients: According to this study, the ophthalmic disease was prevalent in 42.86% and 63.09% of the older age and female gender, respectively **Table 1**.

TABLE 1: SOCIO-DEMOGRAPHIC CHARACTERISTICS OF PATIENTS

		Frequency	Percent
Age	0-5	11	13.09
	6-15	9	10.71
	16-49	28	33.33
	>=50	36	42.86
	Gender	Male	31
	Female	53	63.09

Prescribing Practice: The total number of prescriptions which were analyzed was 84. The total number of drugs prescribed was 186. The

average number of drugs per prescription was 2.2. The analysis of the prescriptions showed that 89.5% of the prescriptions were written in the form of a generic name. Percentage of drugs prescribed from the national essential drug list was 97.2% **Table 2**. The drugs were prescribed in three different dosage forms. Solutions were the most commonly prescribed 58.2% **Fig. 1**.

TABLE 2: PROPORTION OF WHO PRESCRIBING INDICATOR IN BH

Indicators studied	Frequency	Percent (%)
Generic name	166	89.5
EDL	180	97.2
≤2 drug per prescription	79	74.4
Antibiotic prescribed	117	62.7

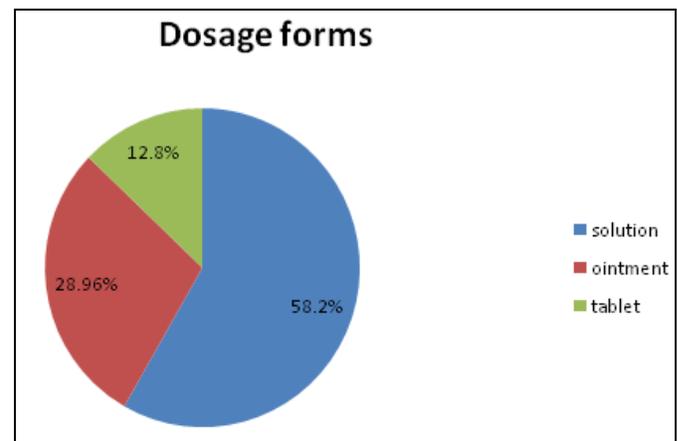


FIG. 1: PERCENTAGE OF DOSAGE FORMS PRESCRIBED AT BH

Antibiotics were written in 62.7% of the prescribed drugs, and 0.6% of the prescribed drugs were mydriatics **Table 3**.

TABLE 3: FREQUENCY OF CLASS OF DRUGS PRESCRIBED AT BH

Class of drugs	Frequency	Percentage (%)
Antibiotics	117	62.7
Steroids	43	22.7
Antiviral	2	0.9
Analgesics	7	3.7
Mydriatics	1	0.6
Antiglaucoma	16	8.6
Total	186	100

The dosage form of drugs was recorded for all prescriptions, and the frequency of administration was recorded for 82.3% of the prescriptions. The duration of treatment was mentioned for 15.1% of the drugs which were prescribed. The diagnosis

was written in 99.8% of prescription and dose of the drugs were indicated in 11.6% of the prescriptions **Table 4**.

Of the total prescriptions, 43.7%, 85.3%, 91.2% and 16.1% of them contain the name, signature, date, and qualification of the prescribers respectively.

TABLE 4: PRESCRIPTION INFORMATION FILLED BY PRESCRIBERS AT BH

Number	Prescription information	Description of evaluation result	
		Present	Absent
1	Diagnosis	83(99.8%)	1(0.2%)
2	Strength	73(86.8%)	11(13.2%)
3	Dose	10(11.6%)	74(88.4%)
4	Frequency	69(82.3%)	15(17.7%)
5	Duration	13(15.1%)	71(84.9%)

Patient Medicine Use Practice:

Past Ophthalmic Medication Use Practice: The assessment of past medication use practice of patients revealed that the percentage of patients responded about the inconvenience for the use of liquid and solid dosage forms were 34.5%, 14.9% respectively.

Of the total patients, 16 (19.1%) of them responded that they used ophthalmic medication for both of their eyes even if only one eye had been infected. Out of this (10.4 %) of them observed an effect on the health eye, which is associated with the medication. Of the patients received ophthalmic drug previously 87.3% of them informed to wash their hands before and after installing the medication and 67.1 % of the total were informed not to touch the tip of the tube. 4.5% of patients shared their ophthalmic medication with their family and 10.4% of them change the frequency and dose by themselves and 98.2% of them informed to close the tube soon after use. 82% of patients were satisfied by the eye care provided from the BH.

Current Ophthalmic Medication Use Practice:

The current use practice of the patients assesses the patient's post-dispensing knowledge at the time of the study **Fig. 2**. It showed that 47% of the patients who have received ophthalmic medication responded the duration of therapy correctly, 57.9% of the total patients had responded the frequency

correctly, 44.7% of them correctly knew the dose and 82.5% of them had adequate knowledge on how to administer the medication.

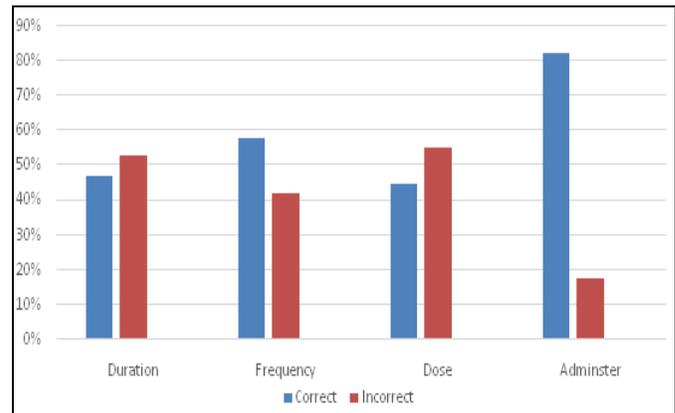


FIG. 2: PATIENT'S POST DISPENSING KNOWLEDGE ON THE DURATION, FREQUENCY DOSE AND ADMINISTRATION OF THEIR OPHTHALMIC MEDICATIONS

Dispensing Practice: The current study revealed that the average dispensing and counseling time was 18sec and 1.30 minute, respectively.

DISCUSSION: Drugs play an important role in improving human health and promoting well-being to produce the desired effect they have to be safe and efficacious and have to be used rationally. The irrational use of drugs is a common occurrence throughout the world²⁰.

Drug utilization studies are important for obtaining data about the patterns and quality of use, the determinants of drug use, and the outcomes of use. The WHO drug use indicators are highly standardized and are recommended for inclusion in drug utilization studies¹⁻³. The present study attempts mainly to describe the current prescribing pattern and drug utilization with the WHO core prescribing indicators in BH.

An average number of drugs per prescription is an important index as it tends to measure the degree of polypharmacy¹. It provides scope for review and educational intervention in prescribing practices. In this study, the average number of drugs per prescription was 2.2, which is approximately similar to the WHO recommended limit that is ≤ 2 drugs in one prescription paper. This demonstrated a restraint on overprescribing and polypharmacy to avoid the risk of drug interactions, adverse effect, development of bacterial resistance, and increased

cost to the patients²³. Other studies from Bangladesh²¹ and Lebanon²² have reported lower figures of 1.4 and 1.6 respectively.

The percentage of drugs prescribed by generic name was 89.5% which was very high compared to studies from Ghana (29%)²⁴, Lebanon (65%)²², Bangladesh (75%)²¹ and Cambodia (68%)²⁵. However, lower compared to the study from Tanzania (99.8%)²⁶. Prescribing drugs by generic name makes the low treatment cost and rational as it avoids prescription writing errors and confusion of dispensing of different brand names which sound alike and spell similar²³. The WHO recommended that 100% of drugs should be prescribed from EDL. In this study, 97.2% were prescribed from EDL. However, a different result was reported in the study from Tanzania (70%)²⁶ and Delhi (95%)²⁷. Increased EDL prescription would rationalize the use and reduce the cost of drugs²⁸.

Antimicrobial has been prescribed 117(62.7%) of the total drugs of 186 in the form of eye drop and ointment. In this study, antibiotics were higher compared to antibiotic prescribing that has been reported from Bangladesh (17.5%)²¹ Lebanon (34.6%)²² and Tanzania (35.4%)²⁶ respectively. The high use of antibiotics may reflect the severity of infections and low sanitation in the region. So appropriate use of antibiotics is necessary to prevent the emergence of drug resistance.

According to this study, the diagnosis was written in 83(99.8%) of the prescriptions. Putting the diagnosis in prescriptions is important to involve pharmacist in the pharmacy therapeutics health problems that could promote the total pharmaceutical care delivered to patients. Including diagnosis on the prescription will help the pharmacist to contribute to positive therapeutic outcomes.

The dosage form and the frequency of drug administration have been recorded in 100% and 82.3% of the cases, respectively. In 15.1% of the prescriptions, the duration of therapy was noted. This study showed a need for the improvement in prescription writing, as the frequency of administration and duration of therapy were missing in 17.7% and 74.9% of the prescriptions,

respectively. This could result in a less safe prescribing. It is always preferred to have a complete prescription which should include name, age, sex, diagnosis and rational drug treatment with less number of drugs, the proper dosage form, the frequency of administration and the duration of therapy. Our hospital-based prescriptions were almost complete in 11.6% of the cases. This indicates that there is a great discrepancy in the completeness of a prescription when it is compared with the 100% WHO standard²⁹. So the physicians should give due attention to minimize this problem by following the good prescribing practice.

Analysis of the patient's knowledge of correct drug dose, frequency, duration, and way of administration showed that there was a great problem. One of the main reasons for this problem is inadequate counseling. Dispensers are encouraged to improve dispensing practice because the patient's knowledge of correct dosage schedule ensures adherence to treatment compliance without indiscriminate use and promotes rational drug use.

Average dispensing time of the current study was 18 sec. Based on the WHO standard, the average dispensing time should be > 5 min. So, this finding is very low compared to the WHO standard. When it is compared to other studies like Sudan 46.3 sec.³¹ and Brazil 18.4 sec.³⁴, the average dispensing time was very low because most of the patients received one drug at a time.

In this study, the average counseling time was 1 min and 30 sec. As compared to the WHO standard, which is greater than 10 min, it is also very low. This had an impact on patients medicine use practice as it was indicated in patients post-dispensing knowledge most of the patients did have poor knowledge; this leads to irrational use of the drug by the patient. Additional effort should be implemented on the dispenser's side to fill this gap.

CONCLUSION: According to this study the most frequently prescribed ophthalmic drugs are antibiotics and most of the prescribing information like dose, duration, and frequency and dispensing information are inadequate and incomplete this end up with unsatisfactory prescribing and dispensing practice. Though the number of drugs per prescription and prescribing drugs from the EDL is

within the WHO standard, prescribing with the use of the generic name of drugs is below this standard. Majority of patients didn't have good post-dispensing knowledge of the dose, frequency, duration, and way of administering the ophthalmic drugs. The prescribers and dispensers should be encouraged on good prescribing and dispensing practice. There is a need to conduct similar studies in other departments, as well to audit a large number of prescriptions and to impart education to the prescriber on rational drug therapy for the benefits and the safety of the patients.

AUTHORS' CONTRIBUTIONS: Alexander M. And Alebachew S.: designed and conducted the study. Oumer S.: Advisor, guided and commented on the whole work, drafted the manuscript, revised critically, and submitted it. All authors have read and approved the final version manuscript.

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COMPETING INTERESTS: The authors declare that they have no competing interests.

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