

## Drug Prescribing Pattern in Mizan-Tepi University Teaching Hospital, South west Ethiopia

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### Abstract

**Back ground:** Rational drug use is one of the essential component of the health care system, because irrational medication use can cause multiple physical, psychological, economic and social effects both at individual and societal level. Hence, dealing with this problem is important in ensuring the safety and well-being of a nation.

**Objective:** To assess the drug prescribing pattern in the outpatient department pharmacy of Mizan –Tepi University Teaching Hospital, Southern, Nation Nationalities and peoples region, Ethiopia. **Method:** A cross-sectional study design was conducted from March 5 to 25, 2016, in Mizan Tepi University Teaching Hospital. WHO drug use indicator format was used to collect the necessary data. Data was analysed using SPSS version 21 and presented using frequency tables and text words. **Result:** 384 patient encounters were prescribed with 811 drugs, from which 260(32.05%) were antibiotics. The average number of drug per prescription was 2.1, and 1.35% injectable per prescription were observed. Most of the drugs (93%) were prescribed by generic and all of them (100%) were from drug list. **Conclusion and recommendations:** The prescribing practices for antibiotic and number of drug per prescription showed deviation from the standard. These two commonly overused and costly forms of drug therapy need to be regulated closely.

**Keywords:** Mizan-Tepi University Teaching Hospital, drug prescribing pattern, Ethiopia.

### Introduction

Drugs enable sick individuals get relieved of their disease and associated complications and result in increased life span and quality of life if used rationally [1]. The expert conference held in Nairobi, 1985 defined Rational Drug Use (RDU) as “A situation where patients receive medications appropriate to their clinical needs, in doses that meet their own individual requirements for an adequate period of time and at the lowest cost to them and their community. Prescribers in this context have a greater responsibility [2].

Studies done to document the drug use pattern indicate that over prescribing, misuse of drugs, use of unnecessary expensive drugs, and over use of antibiotics and injections are most common problems of irrational drug use by both prescribers and consumers [3].

As to 2010 WHO report, nearly half of the medicines are used in appropriately. This finding is supported by data showing that worldwide, 50% of all medicines are prescribed, dispensed or sold in appropriately, while 50% of patients fail to take their medicine adequately. These medication use malpractice occurs universally and has become a global health care issue [4].

A report from Khan, Pakistan showed that there were 22.3% encounters of over dosing, 16.16% drug duplication, 24.25% drug interactions, 3.5% adverse drug effects and 3.8% cases of contra indications. About 70% drugs were costly and were considered as a burden on patients, as cheaper alternatives were available [10]. The minimum drugs reported per prescription were 5 which is not only exceeds the WHO limits of 2 drugs per prescription (5) but also much higher than Nepal (2.91), Brazil (8.6) (6) and India (3.2) (7).

Many reports routinely high light similar problems in drug utilization; poly pharmacy (due both to multiple prescriptions and the prescribing of fixed combination drugs), too frequent and unnecessary use of antibiotics, injections or vitamins, use of incorrect medications to treat specific problems [8].

A study conducted in Andhra Pradesh, India; found that on average 2.46 drugs were prescribed per prescription and 72(4.3%) out of 1662 drugs were found to be prescribed by generic [9].

Another study conducted in Alexandria, Egypt showed that the overall mean number of drugs per prescription was 2.8, percentage by generic was 61%, the percentage of encounters containing antibiotics was 52%, and the percentage of encounters with an injection was 20.6%. And percentage of drugs prescribed from the list was 100% in that clinic [10].

A retrospective study from Ethiopia, Gondar, Bahir Dar and Debre Tabor hospitals on drug prescription pattern for outpatients showed that the average number of drugs prescribed per patient was within the acceptable range (0.98 to 2.2), even though there was a deviation of prescribing pattern among out patients [11]. While another Ethiopia study, Hawassa, stated that the average number of drugs prescribed per encounter was 1.9 (SD 0.91) with a range between 1 and 4. The percentage of encounters in which an antibiotic and injection prescribed was 58.1% (n = 749) and 38.1% (n = 491), respectively. The Percentage of drugs prescribed by generic name and from an essential drug list was 98.7% (n=2419) and 96.6% (n=2367) respectively [12].

Irrational use of drugs can lead to various serious consequences among which, in effectiveness in treatment and lack of safety of the therapy, loss of human life and wastage of resources exacerbation or

prolongation of the disease, distress and harm to the patient, increase in the cost of the therapy, emergence of antimicrobial resistance, spread of blood born infections, and breaching of patients' confidence are the main ones. [13].

Therefore, assessing the prescribing pattern using WHO prescribing indicators might help in tackling these problems and fill the existing gap in the current practice of drug use in the health care system in general and reveals the status of drug use pattern in MTUTH in particular.

### **Method and Participants**

The study was conducted in Mizan –Tepi University Teaching Hospital(MTUTH), out patient pharmacy department from February 30 to March 15, 2016. MTUTH has different units including hospital pharmacy, internal medicine, paediatrics, gynaecology, and surgery. It has 77 beds and 171 health professionals. The hospital serves several zones of SNNPs and Gambella states with approximate catchment population of more than half a million.

#### **Study design**

A retrospective, quantitative, and cross-sectional survey designed to describe the current prescribing practices at Mizan Tepi University Teaching Hospital.

#### **Population**

##### **Source of population**

The prescriptions of all patients who visit Mizan-Tepi University Teaching Hospital during data collection period were include and those prescription with unclear diagnosis, inpatient prescriptions and those from critical care are excluded from study.

##### **Sampling technique, sample size determination and data collection**

##### **Sampling technique**

A prescription of 384 patients were selected using simple random sampling technique was employed. WHO drug use indicator format was used to collect the necessary data. The collected data was reviewed and checked for completeness and consistency. Pretest was conducted on 5% prescription papers which are not included in the final data analysis.

##### **Data processing and analysis**

Data was cleaned and descriptive analysis was performed using SPSS version 20 and results was presented by text, and tables All data in the ordinary prescribing indicator recording form were first analysed manually and then using Microsoft Excel 2013. In the statistical analysis, frequencies, averages/means, and percentages were obtained.

##### **Prescribing indicators**

The WHO prescribing indicators were used in this study. The indicators were pretested, and slight modification was made so that they could be used easily to provide accurate data. The final versions of the pretested indicators are described below. The prescribing indicators that were measured included:

1. **The average number of drugs prescribed per encounter** was calculated to measure the degree of poly pharmacy. It was calculated by dividing the total number of different drug products prescribed by the number of encounters surveyed. Combinations of drugs prescribed for one health problem were counted as one (if any).
2. **Percentage of drugs prescribed by generic name** is calculated to measure the tendency of prescribing by generic name. It was calculated by dividing the number of drugs prescribed by generic name by total number of drugs prescribed, multiplied by 100.
3. **Percentage of encounters in which an antibiotic was prescribed** was calculated to measure the overall use of commonly overused and costly forms of drug therapy. It was calculated by dividing the number of patient encounters in which an antibiotic was prescribed by the total number of encounters surveyed, multiplied by 100.
4. **Percentage of encounters with an injection prescribed** was calculated to measure the overall level use of commonly overused and costly forms of drug therapy. It was calculated by dividing the number of patient encounters in which an injection was prescribed by the total number of encounters surveyed, multiplied by 100.
5. **Percentage of drugs prescribed from an essential drug list (EDL)** was calculated to measure the degree to which practices conform to a national drug policy as indicated in the national drug list of Ethiopia. Percentage is calculated by dividing number of products prescribed which are in essential drug list by the total number of drugs prescribed, multiplied by 100.

##### **Ethical consideration**

Ethical approval was obtained from the Mizan-Tepi University Institutional Review Board.

##### **Results**

A total of 384 patients encounters were attended MTUTH during the study period, the most commonly

prescribed categories of drugs were antibiotics, 260 (32.05%) from which amoxicillin being the top (28.07%) followed by clarithromycin (14.6%). In the study setup the use of third generation cephalosporin seems very low as ceftriaxone comprised only (0.38%), table 1. Cardio-vascular agents, 117 (16.51%) being the second top ranking agents implying that how the public health concern in low and middle income countries being shifting from infectious diseases from the very beginning to chronic cardiovascular disorders recently. Anti-pains, Pain management in the current setup seem given an attention that the use of ant pains was still high relative to other agents and ranking the third according to this finding 110 (13.56%), table 1.

Table 1:-category of drugs prescribed for study subjects attended MTUTH, March 13 to April 1/2016

No.	Category of drug	Frequency	Percentage (%)
1	<b>Antibiotics (over all)</b>	<b>260</b>	<b>32.05</b>
	Amoxicillin	73	28.07
	Clarithromycin	38	14.6
	Augmentin	29	11.2
	Cloxacillin	23	8.8
	Ciprofloxacin	21	8.07
	Doxycycline	18	6.9
	Metronidazole	16	6.2
	Cotrimoxazole	13	5
	Azithromycin	12	4.6
	Norfloxacin	11	4.2
	Erythromycin	3	1.2
	Gentamycin	1	0.38
	Crystalline penicillin	1	0.38
	Ceftriaxone	1	0.38
2	Cardio vascular agents	117	16.51
3	Ant pain	110	13.56
4	Antiulcer	80	9.86
5	Antipsychotics	62	7.67
6	Anthelmintic	60	7.39
7	Anti-anemic	44	5.42
8	An diabetics	21	2.58
9	Antihistamine	8	0.98
10	Antifungal	5	0.61
12	Steroids	4	0.49
13	Antiemetic	4	0.49
14	Anti-asthmatic	2	0.24

During the study period a sample of 384 patient encounters were assessed using WHO core drug use indicators in the medical outpatient pharmacy of Mizan Tepi University Teaching Hospital. A total of 811 drug products were prescribed. Thus, the average number of drug per prescription was 2.1. Thirty-two percent of antibiotics, and 1.35% of injections were prescribed. Almost all drugs (93%) of the prescription were generic name. All of the prescribed medications were from Ethiopian drug list (100%) as shown in table 2.

Table 2:-WHO core prescribing indicators for study subjects attended MTUTH, March 13 to April 1/2016

No.	WHO prescribing indicators	Total drugs	Average/%	Standard
1	Number of drugs/prescription	811	2.1	1.6-1.8
2	Prescriptions with antibiotics	260	32.05%	20-26.8
3	Prescriptions with injectable	11	1.35%	13.4-24.1
4	Generic name prescribing	754	93%	100%
5	Drugs from essential drug list	811	100%	100%

### Discussion

Drugs are highly beneficial in ensuring the freeness and prognosis of humans from different ailments. The average number of drugs per prescription, 2.1, at Mizan –Tepi University Hospital was higher when compared with the standard (1.6-1.8) derived. The finding is higher than the study performed in south west Ethiopia at Jimma Hospital (1.59) [14], Gondar Hospital (0.98), and in Bahirdar Hospital (1.8), but lower than from the finding from Debre Tabor Hospital (2.2) [15]. A high average number of drugs might be due to lack of prescribers' knowledge on impact of polypharmacy, or shortage of single therapeutically effective drugs. A national baseline study on drug use indicators in Ethiopia in September 2002 also found the average number of

drugs prescribed per encounter to be 1.9, which is relatively similar to our finding [16].

The percentage of drugs prescribed by generic name at Mizan Tepi University Teaching Hospital, 93%, is almost similar with the standard derived to serve as ideal (100%) [17]. Our finding sounds better than that of Jimma Hospital, where the percentage of drugs prescribed by generic name was reported to be 75.2%, [14]. The difference of generic name prescription might be due to low income of patient and availability of different branded products at Jimma town as it has more drug stores and pharmacies as compared to Mizan. Another justification could be the knowledge of prescribers' at current study setup on the benefit of prescribing by generic both for the patient in terms of cost and the dispensing pharmacist as many branded products dispensing may confuse the dispenser. Our finding is also much better than the findings from the study of 12 developing countries, the percentage of generic drugs prescribed was (58%) in Nigeria and (63%) in Sudan, but was encouraging in Tanzania (82%) and Zimbabwe (94%) [18].

The percentage of antibiotics were prescribed at Mizan Tepi University Teaching Hospital was 32.05%, which is much higher than the standard (20.0%-26.8%) [17], but better than the finding from Hawassa Teaching and referral hospital where it was found to be 58.1%. However it is encouraging relative to the above mentioned setup, it still suggests that antibiotic prescribing needs to be regulated. The high percentage of antibiotics prescribed in this study setting may be due to patient expectation to receive antibiotics, or prescribers' belief that the therapeutic efficacy of per-os antibiotics is low. Drug use evaluations should be done to evaluate whether the antibiotics were prescribed appropriately or not.

The percentage of injection drug prescribed at Mizan Tepi University Teaching Hospital was 1.35%, which is very lower than the standard (13.4%-24.1%) [17], and the finding of the national baseline survey (23%) conducted in Ethiopia in 2002. Possible reasons for the low use of injections could be beliefs and attitudes of patients and health professionals about injection site pain. Injections are very expensive compared to other dosage forms and require trained personnel for administration. Moreover, unhygienic use of injections can increase the risk of transmission of potentially serious pathogens, such as Hepatitis, HIV/AIDS, and blood-borne diseases.

The percentage of drugs prescribed from the essential drug list for Mizan Tepi University Teaching Hospital in the study Period was 100%, which is identical with the standard (100%) [17]. A similar result was reported from Jimma Hospital, south west Ethiopia where as the national base line study on drug use indicators in Ethiopia in September 2002 showed that the percentage of drugs prescribed from the essential drug list to be 99%, which is very encouraging [16]. The finding for this study was much encouraging and better than the study conducted in 12 developing countries, the percentage of drugs prescribed from the essential drug list was 88% in Tanzania and 96% in Nepal [19, 2].

The finding of this study showed that antibiotics are among the most commonly prescribed drugs (32.05%). Here antibiotics seem to be overused that might possibly result in emergence of resistance, which is the current global issue of concern [20]. This over prescription of antibiotics could possibly be justified by poor diagnosis and wide practice of empiric therapy. This could also have economic impact on the society, the highest possible cost will be incurred to purchase antibiotics for conditions like viral upper respiratory tract infections or for infections in which symptomatic treatment is enough.

Some limitations of this study include; poor handwriting of the prescriber, limited number of patient encounters, and lack of specific place during data collection period was the major challenge of the study.

### **Conclusion**

The prescribing practices for antibiotic and number of drug per prescription shows deviation from the standard recommended by WHO. These two commonly overused and costly forms of drug therapy need to be regulated closely. Amoxicillin and Clarithromycin was the most widely prescribed medications in this study.

### **Declarations:**

**Ethical clearance:** The present study was approved by the Institutional Review Board of MTUTH; Mizan-aman, Ethiopia and the need for informed consent was waived because of the retrospective, anonymous nature of the study. During data collection, confidentiality was ensured and for this reason, name and address of the patient was not recorded in the data collection check list.

**Competing Interests:** The authors declare that they have no competing interests.

### **Authors' contributions**

**TA:** conceived and led the study acquisition of data, interpretation of data, drafted the manuscript performed the statistical analysis; **MB:** assisted with interpretation of data, revised manuscript for intellectual content;

### **Acknowledgements**

We would like to acknowledge pharmacists working in MTUTH for their indispensable cooperation during acquisition of data.

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