

Received on 28 July 2015; received in revised form, 25 September 2015; accepted, 23 October 2015; published 30 October 2015

ASSESSMENT OF DRUG USE BY USING WHO'S PRESCRIBING AND HEALTH FACILITY INDICATORS IN KOMBOLCHA HEALTH CENTERS, NORTHEAST ETHIOPIA

O. Sada ^{*1}, W. Tefera ² and A. Demewz ³

Department of Pharmacy ¹, College of Medicine and Health Sciences, Wollo University, Dessie, Ethiopia.
Kombolcha health center ², Kombolcha town, Ethiopia.
Private pharmacy ³, Kombolcha town, Ethiopia.

ABSTRACT: Despite the complexity of the drug use, several indicators have been developed, standardized and evaluated by WHO/world health organization, which provides useful means of measuring certain aspects of country's drug use. These indicators are grouped into three categories, namely; prescribing indicators, patient care indicators, and facility indicators. **Objective:** The objective of this study was to assess patterns of drug use by using WHO prescribing and health facility indicators in Kombolcha town, Amhara region, Northern Ethiopia from May 15 to May 30/2014. **Methods and Material:** A cross-sectional study was carried out in selected health facilities. Equal numbers of samples were selected from the three health centers (KHC 02, 03, and 05) using a random sampling method until the desired sample size was achieved. Prescriptions were assessed according to WHO/ INRUD guideline (WHO, Policy Perspective on Medicines, 2002). **Result:** A total of 384 prescriptions that included 796 drugs were analyzed. 780 (98%) drugs were prescribed using generic names. The average number of drugs per prescription was 2.1. In 241 (30.2%) of encounters, an antibiotic was prescribed. Injections were prescribed in 64(8%). **Conclusion:** Based on the finding of this study, the prescribing practices for antibiotic shows deviation from the standard recommended by WHO. On the other hand, facility indicators showed that there is a problem in providing key drugs on time and national standards like essential drug lists, formularies, and STGs which are good tools for assisting rational prescribing.

Keywords: Prescribing indicator, Health facility Indicators, WHO, Drug use evaluation, Kombolcha

Correspondence to Author:

O. Sada


Department of Pharmacy, College of Medicine and Health Sciences, Wollo University, Dessie, Ethiopia.

E-mail: oumer.sada@gmail.com

INTRODUCTION: Rational use of drugs provide patients with appropriate medication to their clinical needs, at a dose that meet their requirements for an adequate period at the lowest cost ¹.

Related to irrational drug use in developing countries, which has been described as "irrational" is influenced by a wide range of factors like educational status of the patient, types of professionals, consultation time and intervention to promote safe and appropriate use must be delivered in the context of local service and setting ².

Drug use is a complex subject involving the physician, the patient, the pharmaceutical institution, and dispenser. Each of these is influenced by many factors that are often difficult to measure and quantify. Despite the complexity of

<p>QUICK RESPONSE CODE</p> 	<p>DOI: 10.13040/IJPSR.0975-8232.IJLSR.1(10).302-07</p> <p>The article can be accessed online on www.ijlsr.com</p>
<p>DOI link: http://dx.doi.org/10.13040/IJPSR.0975-8232.IJLSR.1(10).302-07</p>	

the drug use, several indicators have been developed, standardized, and evaluated by WHO/world health organization, which provides useful means of measuring certain aspects of the country's drug use. These indicators are grouped into three categories, namely; prescribing indicators, patient care indicators, and facility indicators. Patient care indicators are average consultation time, average dispensing time, percentage of drugs dispensed, percentage of drugs adequately labeled, and patient knowledge of the correct dosage. On the other hand, facility indicators include; availability of a copy of essential drug list, formulary or standard treatment guideline and availability of key drugs³.

Effective treatments of the patients require rational use of drugs. Drugs should only be prescribed when they are necessary, and in all cases, the benefit of administering the drug should be considered about the risk involved. Bad prescribing habit leads to ineffective and unsafe treatment, exacerbation or prolongation of the illness, distress harm to the patient, and higher cost. Thus, it is very important steps should be taken to promote rational drugs used to promote the health of the public effectively. Irrational use of the drugs is common in a health facility and by the patient, which results in treatment failure, patient compliance, and wastage of economy. All these problems result in poor service outcome from health facilities. To reduce these problems, proper monitoring and evaluation of drug use practice is very important. The purpose of conducting this study is to provide baseline information for those interested to conduct research in this area and finally to give important recommendation for the concerned body for future improvement in drug use practice in health facilities.

Generally, this study was aimed to undertake comparative drug use evaluation about WHO prescribing, and health facility indicators in selected health facilities of Kombolcha town, South Wollo, Amhara region, Northeast Ethiopia

METHODS AND MATERIALS:

Study Area and Period: The study was conducted in Kombolcha town, South Wollo, Amhara region, Northern Ethiopia from May 15-May 30/2014. Kombolcha town is located 378 km from Addis

Ababa. The Woreda has 04 health centers. The prescriptions were collected from the three health centers, and a total of 50 prescribers were involved. Among the total prescribers, 16 were Health officers, and 34 were nurses. The total number of dispensers during the study period was 12. Based on the total patient flow and service rendered in the health centers, three of them were selected for this study. The data was collected from April to May 2014.

Study Design: A cross-sectional study was carried out in selected health facilities. Equal numbers of samples were selected from the three health centers (KHC 02, 03, and 05) using a random sampling method until the desired sample size was achieved. Prescriptions were assessed according to WHO/INRUD guideline (WHO, Policy Perspective on Medicines, 2002). For health facility indicators, Key informant interview was performed to ensure the availability of essential guidelines and key drugs.

Sample Size and Sampling Technique: Prescriptions generated at three Health facilities in the city over one month (April to May 2014) fulfilling the inclusion criteria were assessed. The total sample size was 384. Then divided into three health centers; *i.e.*, 128 prescriptions per health center were included.

Data Collection Techniques: Data were collected by using pretested WHO designed criteria-based data collection formats for the prescriptions. According to WHO's drug use evaluation guideline, outpatient prescribing indicators used include an average number of drugs per encounter, percentage of drugs prescribed in generics, percentage of prescriptions with antibiotics, percentage of prescriptions with injections and percentage of prescribed drugs from Essential Drug List (EDL). Facility indicators used were the presence of key drugs and essential drug list/formulary.

Calculation of Indicator:

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.

2. Percentage of drugs prescribed by generic name was calculated to measure the tendency of prescribing by generic name. It was calculated by dividing the number of drugs prescribed by generic name by the 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 national drug policy, as indicated in the national drug list of Ethiopia. The percentage is calculated by dividing the number of products prescribed which are in essential drug list by the total

number of drugs prescribed, multiplied by 100.

Health Facility Indicators:

Availability of copy of essential drug list or formulary: This was used to indicate the extent to which copies of national essential drug list or local formulary are available at health facility calculated by yes or no per facility.

Availability of Key Drugs: It was calculated by dividing the number of specified products actually in stock by the total number of drugs on the checklist, multiplied by 100.

Data Processing and Analysis: The collected data was cleared, categorized, coded, and tabulated. All data collected were analyzed manually using a scientific calculator. Finally, results were discussed about WHO's indicators, and comparison with different results of other similar studies was done.

Ethical consideration: A formal letter was written from the college of medicine and health sciences, Wollo University to Health centers in which data collection was implemented to get permission to conduct the data collection. Strict confidentiality was assured through anonymous recording and coding of questionnaires and was placed in a safe place.

RESULTS: A total of 384 prescriptions that included 796 drugs were analyzed. 780 (98%) drugs were prescribed using generic names. The average number of drugs per prescription was 2.1. **Table 1** shows the detail of drugs per prescription for each health center.

TABLE 1: DRUGS PER PRESCRIPTION IN KOMBOLCHA HEALTH CENTERS, NORTHEAST ETHIOPIA, MAY 2014

Location	Type of facility	prescriptions	Average no of drugs/prescription	Maximum drugs in a prescription
KHC 02	Public	128	2.3	5
KHC 03	Public	128	2.2	4
KHC 05	Public	128	1.9	4

In 241 (30.2%) of encounters, an antibiotic was prescribed while 9% of encounters had at least two antibiotics prescribed. Injections were prescribed in 64(8%). **Table 2** shows other prescribing indicators evaluated. Ninety-seven percent of the drugs prescribed were listed in the essential drug list even

though no copy of the list was available at one of the health centers at the points of prescription. Furthermore, 69.2% (9 / 13) of key drugs in a model list for the treatment of common health problems were available in the facility studied **Table 4.**

TABLE 2: PRESCRIBING INDICATORS IN KOMBOLCHA HEALTH CENTERS, NORTHEAST ETHIOPIA, MAY 2014

Indicators studied	Value (%)
Average number of drugs per encounter	2.1
Drugs prescribed by generic names	780(98)
Encounters with an antibiotic prescribed	241(30.4)
Encounter with an injection prescribed	64(8)
Drugs prescribed from essential drug list	771(97)
Key drug availability at point of dispensing	9/13(69.2)
Availability of a copy of the essential drug list at point of prescription	2/3(66.7)

Analgesics were the most commonly prescribed drug classes 35.4% of encounters followed by

antibiotics 30.4% and anti-malarials 15% as shown in **Table 3**. Two of the health centers had standard treatment guideline (KHC 02 and 03). The formulary manual was not present in the three health centers studied. **Table 4** shows the availability of key drugs.

TABLE 3: THE MOST COMMONLY PRESCRIBED DRUG CLASSES IN KOMBOLCHA HEALTH CENTERS, NORTHEAST ETHIOPIA, MAY 2014.

Prescribing indicators	Value(%)
Encounter with an analgesic prescribed	35.4
Encounter with an antimalarial prescribed	15.3
Encounter with an antihypertensive prescribed	4.1
Encounter with a multivitamin prescribed	6.5

TABLE 4: AVAILABILITY OF KEY DRUGS AT THE TIME OF DISPENSING IN KOMBOLCHA HEALTH CENTERS NORTHEAST ETHIOPIA, JUNE 2014

S. no.	The key drug in stock to treat the case	K HC 02	KHC 03	KHC 05
1	Oral rehydration salt	1	1	1
2	Cotrimoxazole	1	1	1
3	Ferrous salt + Folic acid tablet	1	1	1
4	(RHZE)/RH or RHZ	1	1	1
5	Benzylpenicillin + CAF	1	1	0
6	Mebendazole Tablet	1	1	0
7	Artimetrine + Lufanterine	1	1	1
8	Cholorquine tab	1	1	1
9	Quinine	1	1	0
10	Phenobarbitone	1	1	1
11	Diclofenac or paracetamol	1	1	1
12	Tetracycline eye ointment	1	1	1
13	Adrenalini	1	1	0

Key: YES = 1; NO = 0; KHC: Kombolcha health center; 03; 02; 05:- Kebele

DISCUSSION: Using the WHO prescribing indicators, this study has provided a better understanding of the prescribing practices in the facilities being studied and has shown areas that need intervention.

In the present study, the average number of drugs recorded per prescription was 2.1, which is almost in agreement with the WHO recommendation 1.6-1.8⁵. A comparable result was reported in a study from Hawassa university hospital, Ethiopia (1.9)⁶. Higher results were reported in studies outside Ethiopia; in Iran showed that the average number of drugs per prescription was 3.4, while a similar

Study conducted in Jammu concluded that the average number of drugs per Prescription was 2.53⁷⁻⁸. The variation in the result may be attributed to

many factors like the variation in the study setup where our study is on health center others are on hospitals so the type and severity of cases appearing may influence a number of drugs per prescription.

High generic prescribing is seen in this study, as 98% had drugs prescribed by their generic name. This finding is almost similar to the WHO recommendation (100%)⁵. Similar result was reported from Hawassa hospital (98.7%)⁶.

In a similar study carried out at Jimma Hospital, south west Ethiopia, the percentage of drugs prescribed by generic name was 75.2%, which is low compared to the standard and to our finding⁹. A national baseline study on drug use indicators in Ethiopia in September 2002 also showed the

percentage of drugs prescribed by generic name to be 87%, which is lower than our finding of 98.7%¹⁰.

Antibiotic resistance among pathogenic microorganisms is a matter of worldwide concern. Antibiotics are among the most commonly prescribed drugs in hospitals and in developed countries. Around 30% of the hospitalized patients are treated with these drugs¹¹. In the present study, antibiotics were prescribed in 30.4% of the total prescriptions, which is slightly higher than the WHO recommendation (20-26.8%). Higher results were reported in a study conducted in Hawassa hospital Ethiopia (58%)⁶ and a national baseline study on drug use indicators in Ethiopia in September 2002 also showed that the percentage of encounters in which an antibiotic was prescribed to be 58.1%¹⁰. Similarly, a study conducted in Nigeria where the majority of prescriptions (83.5%) contained antibiotics. In a study conducted in Jordan, the percentage of prescriptions involving antibiotics averaged 60.9%. In a related study in a private hospital in Dubai, the findings of 21.4% antibiotics prescription were much lower than that of this study¹².

Unsafe use and overuse of injection play an important role in the transmission of very serious blood-borne infections. In the present study, injections were prescribed in 8% of the total prescriptions as compared to 41% in a study in Iran¹². Still, our finding is in line with the WHO recommendation (13.4-24.1)⁵. A study in Ethiopia showed that 38.1% of⁶ prescriptions had injectables and A study in China revealed that 22.93 % of prescriptions had injectables¹³, which are still higher than the current study findings.

Analgesics are the most prescribed drug group in this health facility, with 35.4% of drugs prescribed was analgesic. This may be so due to patients demand and the primary instinct of pain alleviation by prescribers. However, higher values of 64.3 and 41% have been reported from other studies in Nigeria¹⁴. Antimalarials account for 15.3% of the drugs prescribed in this study. This is lower than the 33% reported for Ilorin, and 67% for Warri. A majority (97%) of all drugs prescribed in the encounters studied were listed in Ethiopia's Essential Drug List even though no copy of the list

was found at the various points of prescription in one of the health centers. This value is close to that recommended by WHO (100%)⁵ while it is higher than other reports from abroad¹⁵. Nine out of 13 key drugs (69.2%) from a WHO model list⁵ made for the study were available in one of the facilities studied, but it was 100% for two of the health centers. These key drugs are useful for the treatment of common health problems in the community.

CONCLUSION: Based on the finding of this study, the prescribing practices for antibiotic shows deviation from the standard recommended by WHO. Drug use evaluation should be done for some of the antibiotics to check whether they were appropriately prescribed or not. On the other hand, facility indicators showed that there is a problem in providing key drugs on time and national standards like essential drug lists, formularies, and STGs, which are good tools for assisting rational prescribing. The health center administrative should strive to solve these problems. Baseline data gathered by this study can be used by researchers for further study.

AUTHORS' CONTRIBUTIONS: WT and AD designed and conducted the study. OS supervised the study and did the manuscript preparation and submission. All authors have read and approved the final version manuscript.

ACKNOWLEDGEMENT: We would like to extend sincere thanks to Wollo University for facilitating this work and W/rt Tihut Bekele for typing this Paper.

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

REFERENCES:

1. WHO Rational drug use, Dispensing, prescribing, consoling and adherence in anti retro viral therapy programs conference express 1995.
2. Smith F: drug use in sub-Saharan Africa quality in process safety in use quality and safety in health care 2003; 12: 164-65.
3. WHO how to investigate drug use in health facilities selected drug use indicator action program on essential drugs 1987 Geneva.
4. Standard treatment guide lines for Zonal Hospital, DACA, Addis Ababa Jan 2004; x-xii.
5. Isah AO, Ross-Degnan D, Quick J, Laing R and Mabadeje AFB: The development of standard values for the WHO

- drug use prescribing indicators.ICUM/EDM/ WHO. http://archives.who.int/prduc2004/rducd/ICIUM_Posters/1a2_txt.htm.
6. Anteneh A and Desalegn: Assessment of drug use pattern using WHO prescribing indicators at Hawassa University teaching and referral hospital, south Ethiopia: across-sectional study: *BMC Health Services Research* 2013, 13: 170
 7. <http://www.biomedcentral.com/1472-6963/13/170>
 8. Chedi BAZ, Abdu-Aguye I, Kwanashie HO. WHO Core Prescription Indicators: Field Experience in Public Health Facilities in Kano, Nigeria. *BEST Journal* 2004; 6(3): 66–70.
 9. WHO. Promoting Rational Use of Medicines Saves Lives and Money. WHO Experts Say. <http://www.who.int> 2004; 10: 406-15.
 10. Abdulahi M and Shiferaw T: Pattern of prescription in Jimma Hospital. *Ethiop J Health Dev* 1997, 11(3): 263-67.
 11. Assessment of the Pharmaceutical Sector in Ethiopia. Addis Ababa; 2003. Accessed at
 12. http://www.who.int/medicines/areas/coordination/ethiopia_pharmaceutical.pdf.
 13. Laporte JR: Towards a healthy use of pharmaceuticals. *Dev Dialogue* 1985; 2: 48-55.
 14. Akande TM and Oloye MO: Prescription Pattern at a Secondary Health Care Facility in Ilorin, Nigeria. *Annals Afr Med* 2007; 6: 186-89.
 15. Ibrahim MTO: Physicians' Prescribing Behaviour in Two Tertiary Health Care Facilities in North-Western Nigeria. Analysis of 518 Prescriptions. *Sahel Medical J* 2004; 7: 115-18.
 16. WHO. India's Doctors Warned on Irrational Prescribing. *Essent. Drugs Monitor* 1996; 22: 6.
 17. Krause G, Borchert M and Benzler J: Rationality of Drug Prescriptions in Rural Health Centres in Burkina Faso. *Health Policy Plan* 1999; 14: 291-98.

How to cite this article:

Sada O, Tefera W and Demewz A: Assessment of drug use by using who's prescribing and health facility indicators in Kombolcha health centers, Northeast Ethiopia. *Int J Life Sci & Rev* 2015; 1(10): 302-07. doi: 10.13040/IJPSR.0975-8232.IJLSR.1(10).302-07.

All © 2015 are reserved by International Journal of Life Sciences and Review. This Journal licensed under a Creative Commons Attribution-NonCommercial-ShareAlike 3.0 Unported License.

This article can be downloaded to **ANDROID OS** based mobile. Scan QR Code using Code/Bar Scanner from your mobile. (Scanners are available on Google Playstore)