ORIGINAL ARTICLE

Prescription Completeness and Drug Use Pattern in the University Teaching Hospital, Addis Ababa, Ethiopia

Tamra Assefa[1], Birhanu Abera[2], Tiya Bacha[2], Gebremedhin Beedemariam[3]

[1]Department of Pharmacology and Clinical Pharmacy, School of Pharmacy, CHS, Addis Ababa University, Ethiopia, [2]Pharmacy Services Directorate, Tikur Anbessa Specialized Hospital, CHS, Addis Ababa University, Ethiopia, [3]Department of Pharmaceutics and Social Pharmacy, School of Pharmacy, CHS, Addis Ababa University, Ethiopia

ABSTRACT

Objective: The study aims to the assess prescription completeness and drug use pattern of the hospital using the World Health Organization/ International Network for Rational Use Drugs (WHO/ INRUD) core drug use indicators. **Methods**: The study was carried out at Tikur Anbessa Specialized Hospital (TASH). Three hundred eight four prescriptions were collected retrospectively from prescriptions written for 6 months period from outpatient pharmacies of the hospital. Exit interview was employed to collect necessary information from patients to assess patient care indicators at outpatient pharmacies of the hospital in November, 2015. Observation also applied to all activities of practicing pharmacy personnel at outpatient pharmacies. The health facility indicators were checked by assessing the presence of drug list, formulary and treatment guidelines and also availability of key medicines were checked at the facility during study period. Data entries were done by using Epi Info version 3.5.1 and analyzed using SPSS version 16. **Results:** We found that only just about one fourth of prescriptions contain patient information (age and sex) except full name which was 94.5%. And in only 7.9% of prescriptions the dosage form of drug was indicated and even if presence of other treatment information on the prescription was seems higher. On 384 prescriptions which selected randomly for analysis, 726 drugs were prescribed. Only 88% of drugs were prescribed by generic name, 98.5% of drugs were from the essential drug list of Ethiopia. Percentage of encounters with injection was 53.1%. Encounter with antibiotics were 38% and 70% of the prescribed drugs actually dispensed. The average consultation and dispensing time was 7 minutes and 61.9 seconds respectively. Only 6% drugs were labeled adequately. Only 70% of the patient knew correct dosage about their drugs. 82.5% key medicines were available in the hospital during study period. **Conclusion:** The prescription information was not adequate. The results of the present study with respect to almost all drug use indicators were less than the optimal value. Thus, effective intervention program for promotion of rational drug use practice is recommended.

Key words: Prescription completeness, WHO drug use core indicators, Tikur Anbessa; Ethiopia

Correspondence:

Tamra Assefa,

Department of Pharmacology and Clinical Pharmacy, School of Pharmacy, CHS, Addis Ababa University, Addis Ababa, Ethiopia.

E-mail: tamrat.assefa@aau.edu.et

Access this article online

Website: www.jbclinpharm.org

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INTRODUCTION

It is often observed that the prescribers do not adhere to the process of right prescribing *i.e.,* prescribing the right drug, to the right patient, at the right time, at right dose through the right route.[1] Incomplete information could lead to poor outcome and be harmful to the patient.[2] In order to say a given prescription paper is complete, all parameters that are indicated in the prescription paper has to be completed by the prescribers. These are: patient information (patient full name, sex, age, weight, card number); treatment information (medicine full name in generic, strength, dosage form, dose, frequency, duration of treatment);professionals' information(prescriber's full name, qualification and signature, dispenser's full name, qualification and signature, date of prescribing and dispensing.[2] Medicine use is rational when patients receive the appropriate medicines, in doses that meet their own individual requirements, for an adequate period of time, and at the lowest cost both to them and the community. Irrational use may take many different forms, which may include polypharmacy, over-use of antibiotics and injections, failure to prescribe in accordance with clinical guidelines and inappropriate self-medication.[3]

Bad prescribing habits lead to ineffective and unsafe treatment, exacerbation or prolongation of illness, distress and harm to the patient, and higher costs It also inappropriate prescribing that reduces the quality of medical care and leads to a waste of resources. It has been estimated that half of all patients fail to take their medication as prescribed or dispensed.[4-6] If it is used correctly, it is one of most cost-effective health interventions. However, evidences revealed that more than half of all medicines are not used in an appropriate way. Such inappropriate use endangers lives and wastes scarce resources.[7,8]

Assessment of drug use patterns with the WHO drug use indicators is becoming increasingly necessary to promote rational drug use and to identify problems related to drugs in developing countries.[9] The aim of this study was designed to identify the major problems in prescription completeness and rational use of drugs. This investigation plays a major role to prioritize the main intervention areas regarding rational use of medicines. It is also a base to conduct drug utilization review, antimicrobial resistance surveillance study and rational use of drugs study in the future by identifying drug use related problems.

METHODS

The study was carried out at Tikur Anbessa Specialized Hospital (TASH) located in Addis Ababa, Ethiopia. TASH is a university teaching hospital of College of Health Sciences under Addis Ababa University. The Pharmacy Service Directorate is one of seven directorates found in the hospital. In this directorate there were three outpatient pharmacies and many more pharmacy units during the study period.[10] Institutional based cross-sectional study design was used to collect the quantitative data from prescription papers

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dispensed to outpatients between May 1, 2015 and October 31, 2015 (6 months). Prescriptions which contained only drugs, and drugs and medical supplies and dispensed to outpatients were included in this study. However, the investigation excluded inpatient prescriptions, prescriptions with only medical supplies, fluids and/or parenteral nutrition. For this study, 384 prescriptions were randomly selected retrospectively from prescriptions written for six months period using single proportion method sample size calculation. During systematic random sampling, equal proportion was taken from three outpatient pharmacy units: pediatric 11 prescriptions, free outpatient pharmacy 67 prescriptions and selling pharmacy took 306 prescriptions based on patient load proportions.

Exit interview was conducted to gather necessary information from patients for patient care indicators assessment at outpatient pharmacies of TASH in November, 2015. Observation also applied to all activities of the pharmacy department staff. The health facility indicators were checked by assessing the availability of drug list, formulary, treatment guideline and key medicines at the facility during study period. Patients included were those who attended TASH outpatient clinics, received drugs(s) and were willing to participate. Those who were severely ill, unable to talk and who were not willing to participate were excluded from this study. All other medicines which were not classified as key were excluded from this study. Thirty patients were selected by purposive sampling for exit interview to assess their knowledge on patient care indicators. Equal proportion of patients was taken from three outpatient pharmacy units: one patient interview, 5 patient interviews and 24 patient interviews based on patient load proportions. To assess the availability of key medicines in the hospital, 40 medicines were included according to modified WHO medicines list.[11] Taking into consideration that the selected medicines should treat the common high prevalence diseases and they should be available in the hospital as lifesaving drugs. Their selection was also validated by the team of Pharmacy Service Directorate Director of the hospital, warehouse managers and senior pharmacists who were worked in the hospital for many years.

We used two pharmacists to collect data using data abstraction format composed of prescription completeness and three WHO drug use indicators. Data entry was done by using Epi Info version 3.5.1 and analyzed by SPSS version 16. Simple descriptive statistics was used to get the statistical analysis, frequencies, averages/means, standard deviations and percentages. The findings were interpreted according to standard values of WHO prescribing indicators.[9] A support letter was obtained from School of Pharmacy before conducting the study. TASH Pharmacy Service Directorate gave permission to undertake the study in different pharmacy sections of the hospital. Consent of each participants of the study were taken before interviewed. During the consent process, they were provided with information regarding the purpose of study. Study participants with inadequate knowledge were advised how to take their medicine properly after the interview.

RESULTS

Completeness of prescriptions

In this study assessment of the prescription completeness *i.e.,* patient information, treatment information, and professionals' information was evaluated. We found that only just about one fourth of prescriptions contain patient information (age and sex) except full name which was 94.5%. And in only 7.9% of prescriptions the dosage form of were indicated and even if presence of other treatment information on the prescription was seems higher. Moreover, professional information was very low especially to pharmacists where no dispensers found to put their name, qualification and date of refill on the prescription papers [Table 1].

Prescribing indicators

The total number of drugs extracted from all selected prescriptions were 726 with an average number of drugs per prescription found to be 1.89 (SD=1.16). The total drugs prescribed by generic names accounted for 88% [Table 2]. Mostly prescribed brand products were for Lasix® (furosemide), Plasil (metoclopramide), Mezil (metronidazole) and Neurobin (vitamin B1, B6 and B12 combinations). Out of all prescriptions, 190 (49.5%) of them had only one drug per prescription while 7 prescriptions enclosed 6 drugs [Table 3]. One hundred forty six (38%) encounters had one or more antibiotics. Out of these, 73 (49.5%), 50 (34%) and 7(5%) encounters contain one, two and three antibiotics either alone or combined with other drugs respectively. In number, out of 726 drugs 185 were antibiotics. Among them ceftriaxone injection was found in 63(34%) encounters, metronidazole injection/capsule/oral suspension on 24(13%) encounters and ampicillin in 16(8.65%) injection/capsule/oral suspension encounters.

Patient care indicators

Index of drugs adequately labeled was calculated as percentage of drug packages labeled with at least drug name, dose, strength, frequency and duration. The result of this study showed that only 6% of the drugs were adequately labeled [Table 4]. From the total of 35 actually dispensed drugs, 3 (8.6%) was labeled with drug name, dose and dosage schedule. The average consultation and dispensing times, and percentage of patients who knew about their drug regimen were illustrated in Table 4.

Health facility indicators

Presence of supportive reading materials (formulary, drug list, treatment guideline) is vital for health professionals' continuous professional improvement and good patient outcomes. Their availability status in the hospital is shown in Table 5 but they are yet not reached to the end users. Key essential drugs availability in the hospital was determined to be 33(82.5%) drugs during data collection [Table 6].

Table 1: Prescription completeness assessment at tikur anbessa specialized hospital (N=384 prescriptions)

S.N	Patient information		Treatment information		Professional information			
					Prescribers		Dispensers	
	Parameters	%	Parameters	%	Parameters	%	Parameters	%
1	Full name	94.5	Drug name, strength,	74.3	Full name	18.4	Full name	0
2	Sex	26	Dose	78.5	Qualification	14.2	Qualification	0
3	Age	25.1	Frequency	74.6	Date	22.4	Date	0
4	Weight	0.3	Duration	50.2	Signature	55	Signature	2.4
5	Card No.	22.4	Dosage form	7.9				

Table 2: Summary of prescribing indicators result obtained at TASH

Prescribing Indicators	Total encounters/drugs	Average/Percent
Average number of drugs per encounter		1.89
Percentage of drugs prescribed by generic	639	88.02
Percentage of encounter with antibiotics	146	38.02
Percentage of encounters with injection	204	53.1
Percentage of drugs from essential drug list	715	98.5

Table 3: Number of prescribing drugs per prescription result obtained at TASH (N=384 prescriptions)

Number of drug(s)	Number of prescription (%)
One	190 (49.5)
Two	107 (27.9)
Three	50 (13)
Four	20 (5.2)
Five	10 (2.6)
Six	7 (1.8)

Table 4: Summary of patient care indicators result obtained at TASH

Patient care indicators	Total encounters	Average/percent
Average consultation time	30	7.0 min (SD=4.69)
Average dispensing time	30	61.9 sec (SD=22.88)
% drugs actually dispensed	30	70%
% of drugs adequately labeled	30	6%
% knowledge of correct dosage	30	70%

Table 5: Availability of copy of essential drug list, formulary and standard treatment guideline at TASH, November 2015

No	Availability of support materials in the hospital	Yes/No	Distributed to the staff (Yes/No)
1	Ethiopian national formulary	Yes	No
2	Standard Treatment Guidelines (national)	Yes	No
3	Formulary (facility)	No	No
4	Standard Treatment Guidelines (facility)	Yes	No
5	National drug list (NDL)	No	No
6	Hospital drug list	Yes	No

Table 6: Distribution of availability of key medicines in TASH, November, 2015

Key medicine description	Status	Key medicine description	Status
Adrenalin 0.1% inj	1	Magnesium Sulphate inj	1
Amitriptyline 25 mg tabs	1	Metformin 500 mg tabs	1
Amoxicillin125 mg/5 ml(250 mg/5 ml)OS suspension	1	Methyldopa 250 mg tabs	1
Amoxicillin 250 mg/500 mg caps	1	Metoclopramide 10 mg/ml inj	1
Atenolol 50 mg tabs	0	Metronidazole 250 mg caps	0
Atropine 1 mg/ml inj	1	Morphin 10 mg/ml oral syrup	1
Ceftriaxone 500 mg/1 g inj	1	NPH 1000 IU inj	1
Cimetidine 200 mg/2 ml inj	0	ORS powder	0
Ciprofloxacin 500 mg tabs	1	Oxytocin 10 IU inj	1
Dextrose 40% iv inf	1	Paracetamol 120 mg/5 ml or supps	1
Diazepam 5 mg/ml inj	1	Phenobarbitone 30 mg/100 mg tabs	1
Dopamine 40 mg/ml inj	1	Regular insulin 1000 IU inj	1
Enalapril 5/10 mg tabs	1	Salbutamol 200 mcg oral inhaler	1
Ferrous sulphate+folic acid tab	1	Simvastatin 20 mg tab	1
Furosemide 10 mg/ml inj.	1	Normal Saline 0.9%) iv inj	1
Heparin 25000 IU inj	1	Cotrimoxazole 240 mg/5 ml susp/tabs	1
Hydralazine 20 mg/ml inj	1	Tetracycline eye ointment	1

Hydrochlorothiazide 25 mg tabs	1	Tramadol 50 mg/ml injection	1
Hydrocortisone 100 mg inj	1	Vitamin K (Phytomenadione) 10 IU injection	1
Lidocaine 2% inj	0	Warfarin 5 mg tablets	0

1=Yes (Drug was available), 0=No (Drug was not available) during study period, tabs: tablets, OS: Oral Suspension, caps: capsule, inj: injection, inf: infusion, ORS: Oral hydrate salt, supps: suppositories.

DISCUSSION

Even though, it is well understood that prescriptions should contain filled all the required information (*i.e.,* patient, treatment and professionals information) but very unfortunately almost all the assessed prescriptions were incomplete which contained at least one or more unfilled parameters. Regarding the patient information, 5.5% of prescriptions had no name of patient at all and the same number was reported by Bhosale, Writing age and sex of patients on prescriptions by prescribers was almost three times lower than this Indian study. Moreover, this poor practice was contrary to finding from Nigeria as they figured out patient weight was written on 72.5% of prescription and writing patient' age and sex was roughly four times better than our finding.[2]

On drug information which has to be existed on standard prescription, we found similar results in terms of writing the strength of drug with that of Bhosale *et al.* However, in only 7.9% of prescription the type of dosage form was mentioned and extremely different from Bhosale *et al.* findings (77.93%)[12] even it has to be 100%. About 50% and 75% of prescriptions had the duration and frequency of treatment on the present study, respectively. These finding were again lesser than what reported elsewhere.[2,13]

There were only 18.4%, 14.2% and 55% of prescribers, who wrote their name, qualification and who put their signature on the prescriptions respectively, to assure they took responsibility for any accountability. In terms of this prescriber's information, it was lower than Indian study as 46.25% (full name), 21.75% (qualification) and 73.25% (signature)[12] and Nigerian study (prescriber name (95%) and signature (98.2%)[2] of physicians placed the required information on prescriptions. This poor practice make difficult to identify the responsible prescriber for any feedback and clarification when required. It is extremely difficult to get prescription papers that carry signature of the dispenser and no one wrote his/her name on the prescription after dispensed drug(s) to the clients. In contrary to this, in 92.1% of prescriptions, the dispensers put their signature after refill in pediatric emergency section of a tertiary hospital in Lagos, Nigeria.[2] Preparation and implementation of standard prescription in all departments and units of the hospital is crucial as there were difference on the type and content of the prescriptions used by the practitioner. Training has to be provided to the health professionals on good prescribing and dispensing practice to promote rational use of drugs.

The average number of drugs per prescription was found to be 1.89 which was more or less similar to other studies findings *i.e.,* 1.9 and 1.85 from Hawassa Teaching Referral Hospital, Ethiopia and the State of Goa, India.[14,15] However, it was better when compared with that the studies conducted at Ayder Referral Hospital, Northern Ethiopia (2.61)[16] and other low and medium income countries as it ranged from 2.34 to 4.07.[17-23] The result of our research fulfilled the WHO recommendation (<2). The lesser the number of drugs prescribed; it is a positive sign of good prescribing practice. It reduces polypharmacy and in turn minimizes hospitalizations due to drug interactions and adverse drug reaction.[5]

In this investigation generic prescribing was 88% which expected to be 100%. Finding from Brazil at different levels of health care[24] reported almost similar result (86.1%) with our study. Our finding is less than that of Hawassa Teaching Referral Hospital, (98.7%) study[14], Cambodian primary care centers (99.7%)[22], Egyptian health centers (95.4%)[25] and Northern Ethiopia (93.3%).[26] On the other hand, generic prescribing was better than studies from Nigerian (69.8%) [19] and Nepal's tertiary care hospitals (59%)[20] and far better than Indian study finding (15.36%).[18] Prescribing by generic name helps the hospital pharmacy to have a better inventory control. This will also help the pharmacy to purchase the drugs on contract basis, as the number of brands is less. It can also reduce the confusion among the pharmacists while dispensing generic drugs are often more economic than the branded ones. Prescribing by brand name may be an evidence of vigorous promotional strategies by pharmaceutical companies.[14,17]

The percentage of encounters in with antibiotics were prescribed at TASH was 38%, which is lower than other similar studies conducted in Ethiopia.[7,27,28] In Nigerian and Nepal's tertiary care hospitals, Egypt, India, Cambodia and Pakistan at different level of health care facilities this number ranges to from 39% to 66%.[18-22,25,29,30] However, the result from our study showed increased antibiotics prescription rate when compared with Yemen (28.8%) and India (31.8%) studies[16,31] and also it was almost three times higher than finding from Brazilian reports (13.1%).[24] WHO set that as percentage of prescriptions with antibiotics should not be greater than 35% in health care facilities. Our finding suggests that antibiotics prescribing needs to be regulated even if, to some extent it was over prescribed when compared with the standard. [5] The possible recommendations to minimize the risk are: setting prescribing limit (restricting prescribing privileges where access to antibiotics will be left to only senior prescribers or in consultation with seniors); and performing antimicrobial resistance surveillance to see the sensitivity of antimicrobials in the hospital by respected departments. And also conducting drug use evaluation will be important to evaluate whether the antibiotics were prescribed appropriately or not.

Injections were prescribed in 53.1% of encounters and it was higher than WHO standard value (less than 25%); and other developing countries studies like Pakistan (15.7%)[21], Egypt (9.9%)[25], Yemen (46%)[20] and Ethiopia [31%, 23.6%].[7,27] Furthermore, it was significantly different from Indian (1.95%) and Nepal's (3%) tertiary care hospitals, Brazil at different levels of health care (2.5%) and teaching hospital in Southwestern Ethiopia (2.9%)[17,18,24,32] respectively. Assessment on beliefs and attitudes of patients and professionals about the relative efficacy of injection and per oral medications; and cost implications could be one possible recommendation for future intervention. The percentage of drugs prescribed from essential drug list (EDL) was 98.5%. It was excellent prescribing practice and better than studies conducted at various tertiary care hospitals in Mumbai (90.3%)[30] and Ethiopia in different study set ups for example, prescribing from EDL was in 91.7% in Dessie Referral Hospital[27] and in Hawassa Teaching Referral Hospital (96.6%).[14] Our finding was much higher than that of tertiary care hospitals in Ludhiana, India (66%)[33] and universities affiliated hospitals in Brazil (73.7%)[27]. While in EDL drug prescribing is essential in the sense that it decreases amount of unwanted drug prescription and escalates price; and promotes rational use of drugs. Prescribing drugs from the EDL issued by WHO means rational prescribing: drugs from the list are older drugs, already tested in practice, with established clinical use, and of lower cost than newer

drugs.[11]

Result of the average consultation time in this study was only 7.0 minutes (mins). This figure could be far better than Pakistanis survey (1.79)[31] and Nepal's primary care facilities (2.02).[21] The result was almost similar to Egyptian primary care study and ten primary health care facilities in Saudi Arabia which reported 7.1 mins[21] and 7.3 mins[34] respectively. However, study from four hospitals in Western Ethiopia found longer consultation time *i.e.,* the total average of 18.20 mins.[35] The consultation time reported in our study is considered to be insufficient to conduct proper history taking, complete physical examination, appropriate health education instructions, and good physician–patient interaction they as spent shorter time patients. This is important to ensure good patient care. As per WHO standards (10 mins), seven minute is too short to conduct a complete patient evaluation and prescribe therapy. Short consultation time reported in this study could be a result of high patient flow.

The dispensing time in our study was found to be 61.9 seconds. It was almost four times and six times shorter than what reported from Cambodian primary care centers[21] and Ethiopian Hospitals by Fereja and Lenjessa[35] studies respectively. However, it was longer than studies conducted in Nepal primary care facilities (42.52 seconds)[21], Pakistan survey of health care facilities (42.3 seconds)[21], Jimma University Specialized Hospital, Ethiopia (22.5 seconds)[36] and Southwest Ethiopia.[37] And but very low when compared to the WHO standards (>3 mins). Shorter dispensing time result reflects poor proper counseling for patients regarding drug therapy during the time of dispensing. The prime reason could be due to busy patient flow, improper dispensary set up *i.e.,* absence of separate counseling encounter, and in some cases, the pharmacists think that the patient has full information since most of the patients in our setting are chronic patients and took the drug for a long period of time as tried to be noticed during study period.

Amount of drug actually dispensed to patients in our study (70%) is low when compared to results reported from Nepal (89.69%), Saudi Arabian (99.6%), Egyptian (95.9%) and Ethiopian (97.3%) health care facilities studies.[3,25,34,37] On the other hand availability of prescribed drugs was better than Indian study (76.9%)[12] and Pakistan's survey report (59.3%).[37] This finding may not easy to assess as there were cases where patients did not require to be refilled with what prescribed for them like in case of if they had enough stock of drug(s), if they hadn't enough money to buy the drugs, and other reasons which were not explored in the current study.

In this study, drug labeling practice was very poor, only 6% of drugs had adequate label on them. The figure shows significant deviation from the ideal value of 100%. The finding from this study is less than the mean labeling score accounted 50% in Jimma University Specialized Hospital.[36] Labeling has an important role for promotion of rational drug use. The WHO recommendation is each drug label should contain dose regimen, patient name, and drug dose. The name on the drug label is a serious matter, with potentially serious consequences; drug misuse and drug abuse. The reasons for such poor labeling in our hospital involve lack of training and overcrowded dispensing settings. Therefore, such poor labeling practice needs improvement by employing different mechanisms. Among those, enforcing the implementation of 100% labeling of all drugs by the proposed labeling items; develop a labeling system and disseminate already prepared labels that are easy to write quickly (preprinted) can be mentioned.

The percentage of patients who knew how to take the drugs dispensed to them was 70% as compared with an ideal value of 100%; and it was comparable with studies of health facilities in Southwest Ethiopia (68% to 77.14%).[36,38] However, in this regard, lower number of our patients knew about their drug(s) regimen as compared with studies from West Ethiopia in four hospitals (82%), Wolkite Town, Ethiopia (92%)[35] and primary health care centers in Eastern province, Saudi Arabia (79.3%).[6] In Nepal tertiary care hospital 53.8% of patients partly knew the administration time and quantity of drugs to be taken.[17] In another Nepal's study, only 30% of patients knew the correct dosage.[34] The main reason for the low level of knowledge could be due to high patient work load, inappropriate counseling, and absence of appropriate counseling area, negligence of pharmacists, inadequate labeling and more or less poor patient educational background. This can be improved by preparation of counseling tip for pharmacists that are ready to use urgently and found in nearby, and provision continuous medical education to pharmacists on good dispensing practice.

In the health facility studied only copy of hospital drug list, national drug formulary, and national and hospital standard treatment guidelines were found. Even if this is tertiary university teaching hospital there were no copy of hospital based formulary and Ethiopian Essential Drug List (EDL) during the study period. Angamo *et al.,* and Bashrahil also mentioned that as these reading materials were not complete in health facilities of Southwest Ethiopia and health services in Hadramout, Yemen, respectively.[20,36] To solve these drawbacks, the hospital should establish means to get those materials from government and nongovernmental organizations as appropriate and also devise a mechanism to distribute them to the staff; and also establish on the other hand, the optimal value for the percentage of key drugs in the stock was expected to be 100%. However, the percentage of key drugs found in the stock was 82.5% [Table 6]. The result of the present study was higher than what reported from Saudi Arabia study (59.2%).[6]

This is unsatisfactory indicator of medicine availability in the hospital and needs solution since these medicines are very vital for the hospital and also they should be available in the hospital always. The potential recommendations are: developing standard operating procedure that guide the procurement policy of pharmaceuticals in the hospital; creating hospital based procurement committee solely responsible for medicine procurement as they are different from other commodities and full implementation of integrated pharmaceutical logistic information in the hospital especially the need to improve the quantification and inventory system.

Shortage of the drug supply of essential drugs that treat common health problems is harmful to health status of patients. The possible reasons for this could be shortage from the supplier(s), absence or status of procurement policy specifically for medicines procurement, absence of scheduled procurement timetable, process of acquiring from private source for those medicines which were not available from the government supplier, lack of transportation and budget constraint, in the studied hospital. Moreover, this probably increases the percentage of prescribing medicines out of the stock. WHO recommends adherence of physicians to the drugs listed in the EDL/formulary while prescribing medications to ensure proper health care.

CONCLUSION

This study measured the performance of Tikur Anbessa Specialized Hospital regarding prescription completeness; and drug use patterns using the WHO/INRUD core drug use indicators and prescription completeness during the study period. With respect to prescribing indicators, results of the present study were less than the optimal value except that of average drugs per encounter. Concerning patient care indicators, results were far from the optimal value especially for average consultation time and drug labeling. Patient care provided by healthcare professionals was insufficient and thus effective intervention program for promotion of rational drug use practice is recommended. With regard to facility specific indicators, results of this study shows deviation from the standard recommendation of World Health

Organization. The study has also provided an entry point for selecting an intervention that will provide the most impact on the outcome or quality of care.

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