Research Article　　　　　　　　　　　　　　　　　　　　　　**OMICS International**

Assessment of Drug Use Pattern by Using WHO Core Drug Use Indicators at Public Hospitals in Ethiopia

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Abstract

Background: Drug use is a complex subject involving the prescriber, the dispenser, the patient and pharmaceutical institutions. It is influenced by factors such as drug availability, prescriber's experience, and knowledge of dispensers, health budget, cultural factors and many more. Inappropriate drug use is the problem of the whole world; however the degree of the problem is higher in developing countries like Ethiopia.

Objective: To assess drug use pattern by using who core drug use indicators at public hospitals in Gamo Gofa Zone, Southern Ethiopia September 2013.

Methods: Retrospective and prospective cross sectional study were used to collect data from prescriptions dispensed through the general outpatient pharmacies and Information for patients respectively. A pretested structured questionnaire was employed to collect information from prescription papers and respondents after obtaining a verbal consent. Data was entered, cleaned, edited and analysed using SPSS Version 16.0 statistical software package.

Results: The average number of drugs per prescription was 1.77 in Arba Minch General Hospital and 1.95 in Chencha District hospital ranging from 1-5. Percentage of encounter with antibiotics was 292 (48.67%) and 360 (60.20%) respectively. The Percentage of drugs prescribed by generic name and from an essential drug list was 100%. The mean consultation time spent between the prescriber and patient was 3.82 minutes and 3.66 minutes respectively and the mean pharmacy dispensing time was 1.18 minutes and 1.33 minutes respectively. More than half Patients had knowledge on drug dispensed to them 60.0% and 52.0% respectively and none of drugs dispensed were adequately labelled.

Conclusion: In our study the labelling status of prescribed medicines was very poor and needs special attention. Dispensing time is very short and it could have influenced patient's knowledge on dispensed drugs. Furthermore designing strategies to improve availability of key essential drugs; establishing antimicrobial stewardship committee in both hospitals and improving drug and therapeutics committee by responsible bodies.

Keywords: Drug use; Prescribing indicator; Patient care indicators; Facility indicators, Gamo gofa

Abbreviations: ADR: Adverse Drug Reaction; DTC: Drug and therapeutics committee; EDL: Essential Drug List; EP: Emergency Pharmacy; FMHACA: Food Medicine and Health Care Administration and Control Authority; HAI: Health Action International; INRUD: International Network for the Rational Use of Drugs; IPP: In Patient Pharmacy; LIDE: List of Drugs for Ethiopia; OPD: Out Patient Department; RDU: Rational drug use; SNNPR: South Nations Nationalities and Peoples Region; USP: United States Pharmacopoeia; WHO: World Health Organization

Introduction

The International Network for the Rational Use of Drugs (INRUD) generated indicators in three main drugs use areas namely prescribing, patient care and drug systems [1,2]. Rational Use of Drug (RUD) requires that patients acquire medications appropriate to their clinical needs, in doses that meet their own requirements, for an adequate period of time, and at lowest cost to them and their community (WHO) conference at Nairobi 1985 [3].

Rational use of medication saves life and economy of health care costs. It limits undesired toxicity and adverse events and maximizes on the benefits that can be derived from optimal use of medications [4]. Misuse of drugs occurs in all countries mainly in developing countries and common types of irrational medicine use are: the use of too many medicines per patient (polypharmacy); inappropriate use of antimicrobials; inadequate dosage; over-use of injections when oral formulations would be more appropriate; failure to prescribe in accordance with clinical guidelines and inappropriate self-medication, often of prescription only medicines [5].

Over-use of antimicrobials is leading to increased antimicrobial resistance and it can stimulate inappropriate patient demand, and lead to reduced access and attendance rates due to medicine stock-outs and loss of patient confidence in the health system [6,7]. Worldwide more than 50% of all medicines are prescribed, dispensed, or sold

inappropriately, while 50% of patients fail to take them correctly. Moreover, about one-third of the world's population lacks access to essential medicines [8].

Essential medicines are not affordable to majority of the population in developing countries. This results in situations where a family ends up sharing medicines that were prescribed to treat one person [9]. According to surveys conducted by health action international (HAI) Africa and WHO in 11 Sub-Saharan Africa countries in 2004, the median availability of the essential medicines in public health facilities was below 70% [10].

Drugs are major components of pharmaceutical care. Hence, current expenditure on drugs rises up to 20% to 50% of total investment on health in developing countries [11-13]. Study conducted in Nepal showed that nearly 42% of the health budget is spent on drugs and international donors spend another three times, 80% of medicinal products are imported to Nepal however, the availability of drugs in the health posts and clinics are sporadic resulting into the prevalence of inappropriate drug use [14,15].

Study conducted in teaching hospitals of India showed that only one-fourth of the participants claimed that they always prescribed Essential Medicine; only 15.1% of the clinicians wrote the generic names of drugs on the prescription slip [9]. Another study carried out in India reported that 46.2% of the drugs were prescribed by generic name, but 45.6% of the prescribed drugs were irrational drug combinations. Only 45.7% of the prescribed drugs were according to the WHO model list of essential drugs.

Study conducted in Nigeria at a university teaching hospital showed that the prescription of several drugs per patients (poly pharmacy) is a serious problem with the average number of drugs per prescription is 2.8 (range 2.2-3.8) [16-18] and in other study conducted in Niger, almost 100% of the prescriptions in the name of essential and generic drug in the national drug list were [12].

Even though irrational drug uses are common in both developed and developing countries, the degree of the problem is higher in developing countries like Ethiopia where practices such as poly pharmacy, the use of wrong or ineffective drugs, under use or incorrect use of effective drugs and overuse of antimicrobials and injections are very common [19].

Currently there are few pocket studies are conducted on rational drug use in developing countries including Ethiopia [10]. However there is no similar study in Public Hospitals of Gamo Gofa Zone. There for this study was aimed to describe drug use pattern factors at public Hospitals in Gamo Gofa Zone and it would help to improve prescribing and dispensing practice drugs. It would also provide baseline information for researchers who are interested to conduct further studies to determine factors drug use pattern in these facilities.

Research Methodology

Study area and period

The study was conducted at the general outpatient of Arbaminch and Chencha hospital which are two hospitals among three hospitals found in Gamo Gofa zone, in SNNPR, from September 1 to 30, 2013. These hospitals provide outpatient, inpatient, emergency and other specialized services to a total population of about 3,741,304 (Gamo Gofa Zone) extrapolated from CSA 2007 data.

Arbaminch Hospital is located in Arbaminch Town which is 505 km to South of Addis Ababa. The hospital has 7 specialists, 15 General Practitioners, 13 Health Officers, 70 Nurses, 4 Pharmacists, 7 Druggists, 10 Laboratory Technologists, 10 Laboratory Technicians and 2 environmental health professionals.

Chencha Hospital is located in Chencha Town, which is about 547 km to South of Addis Ababa. The hospital has 4 General Practitioners, 7 Health Officers, 26 Nurses, 1 Pharmacists, 4 Druggists, 10 Laboratory Technologists, 4 Laboratory Technicians and 1 environmental health professional.

Source population: All patients who were visiting Arbaminch and Chencha Hospital during the study period were source populations.

Study population: All Patients visiting the general OPD with a prescription from the two hospitals during the study were enrolled in the study.

Study Design: Retrospective and prospective cross sectional study were used to collect data from prescriptions dispensed through the general outpatient pharmacies and Information for patients respectively.

Eligibility Criteria

Inclusion criteria

Patients 18 years and above, willing to participate, Prescriptions written in year 2013 and Legible and complete

Exclusion criteria

Patients below 18 years of age, Unwilling to participate and incomplete prescription

Sampling technique and sample size

The "minimum" recommended sample size for a prescription indicator is 600 encounters for study carried out in a single health facility [6]. For this study, prescriptions dispensed through the general outpatient pharmacy during 2013 were retrieved and arranged chronologically based on the date of dispensing. A total of 1198 prescriptions; 600 from Arba Minch General Hospital and 598 from Chencha District were drawn by systematic random sampling method. Data for patient care indicators were collected prospectively for randomly selected 100 outpatient encounters getting service in the outpatient pharmacy.

Variables

Dependent variable

Rational drug use based on WHO indicators

Independent variables

Socio-economic Variables: age, sex, educational status, marital status, religion, ethinicity occupational status, economic status

Prescribing indicators: Average number of drugs per encounter; Percentage of drugs prescribed by generic name; Percentage of encounters with an antibiotic prescribed; Percentage of encounters

with an injection prescribed; Percentage of drugs prescribed from the essential drug list or formulary

Patient care indicators: Average consultation time; Average dispensing time; Percentage of drugs actually dispensed; Percentage of drugs adequately labelled; Patient's knowledge of correct dosage;

Health facility indicators: Availability of copy of essential drug lists; Availability of copy of drug formulary; Availability of key drugs in the facility; Availability of Drug therapeutics committee and Availability Antimicrobial stewardship committee

Data collection tools

Standardized tool used by WHO/INRUD (International Network of Rational Use of Drugs) containing three major groups of indicators was adapted to consider current situation of the country and global agenda specially antimicrobial resistance, so we included two more indictors in facility indicators previously used;- these are Availability of drug and therapeutics committee and Availability of antimicrobial stewardship committee. Standardized tool in this contain the following three domains; 1) Prescribing indicators include: Average number of drugs per encounter; Percentage of drugs prescribed by generic name; Percentage of encounters with an antibiotic prescribed; Percentage of encounters with an injection prescribed; Percentage of drugs prescribed from the essential drug list or formulary; 2) Patient care indicators: Average consultation time; Average dispensing time; Percentage of drugs actually dispensed; Percentage of drugs adequately labelled; Patient's knowledge of correct dosage;3) Health facility indicators: Availability of copy of essential drug lists; Availability of copy of drug formulary; Availability of key drugs in the facility; Availability of Drug therapeutics committee and Availability Antimicrobial stewardship committee.

Data on socio-demographic characteristics of patients were collected by semi-structured questionnaire by face-face interview. Labelling information and patient knowledge on dispensed drugs of the patients was collected after dispensing by observation and interview. The data were collected in five working days with about 20 patient encounters covered per day at peak working hours. Data on Availability of facility indicators was made interviewing and professionals working outpatient pharmacy and supported by observations by data collectors performed to ensure the availability of essential guidelines and key drugs in the stock. One day training for eight pharmacy technicians for data collection and two pharmacists were given by principal investigators on data collection tools and principles.

Data collection procedures and quality control

The questionnaire was Pre-tested on 10% of sampled patients to reduce bias related to measurement, misclassification. Questionnaire was reviewed by Data collectors and supervisors for completeness and for logical consistency, and counter checked by the principal investigator on daily basis and the collected data were appropriately coded, recorded, stored and processed.

Data analysis

Data were coded, checked for completeness and consistency. Then the data were entered and analyzed using SPSS for windows version 16.0 statistical software program. For descriptive statistics, results were expressed in terms of means and percentages and presented using

tables and graphs according to the types of tool used. Values of the indicators obtained were compared with international standards, WHO, and results of other similar studies.

Ethical considerations

The study was ethically cleared by south nations and nationalities people's regional health office ethical committee and permission was obtained from officials of both hospitals. Interview was carried out only with full consent of the patient/caregiver and parent being interviewed. Each respondent was assured that the information provided by him/ her would be confidential and used only for the purpose of research.

Operational definitions

Complete prescription: superscription (prescription which contains name of the patient, date of prescription, card number, sex and age); inscription (drug name, strength, route, frequency, duration of treatment) and subscription (Prescriber name, signature date; Dispenser initials, date, Signature) otherwise incomplete.

Dispensing time: is the time interval between the patients giving the prescription to dispenser and leaving the dispensary.

Drug Knowledge: respondents will be labelled to adequate drug knowledge if they are able to tell the correct dose, frequency of administration and length of therapy/duration, storage condition and precautions of prescribed medicine at exit interview unless poor.

Drug: means any substance or mixture of substances used in the diagnosis, treatment, mitigation or prevention of a disease in man or animal.

Generic drug: non-proprietary name of drugs and some commonly used brand names of known drug combinations such as Coartem, Terracortril, and Augmentin® were considered as generic names.

Labelling: is adequate if the label contains; the generic name of drug, Strength, dose, quantity dispensed, frequency of administration, direction for use, expiry date, name of the patient, name, storage conditions and special precautions.

Number of drugs per prescription: Known combination therapies like triple therapy for *H.Pylori* was not counted as 3 and diuretic, ACEI and spiranolactone for cardiac failure was not counted as 3 in recording the number of drugs per prescription and medical supplies like Gloves and syringes were not counted as drugs.

Prescription: means any order for drug written and signed by a duly licensed or authorized medical practitioner issued to a patient in order to collect drug from dispensing unit.

Results

Socio-demographic characteristics of Patients

A total of one hundred (100) patients from each hospital were participated in the study. Regarding socio-demographic characteristics Majority of participants from both hospitals were males 76 and 58 in Arba Minch General hospital and Chencha district hospital respectively. Majority of participants were Gamo by ethnicity and about one half of the participants were in age group of 25-34 years (Table 1).

Socio-demographic characteristics		Arba Minch Hospital (n=100)		Chencha Hospital (n=100)	
		Frequency	Percent	Frequency	Percent
Sex	Male	76	76	58	58
	Female	24	24	42	42
Age	15-24	3	3	5	5
	25-34	52	52	48	48
	35-44	28	28	32	32
	≥ 45	17	17	15	15
Religion	Orthodox	52	52	42	42
	Muslim	12	12	8	8
	Protestant	33	33	45	45
	Catholic	3	3	5	5
Ethnicity	Gamo	45	45	86	86
	Gofa	32	32	5	5
	Wolayita	13	13	7	7
	Gurage	8	8	2	2
	Others	2	2	0	0
Marital status	Single	17	17	12	12
	Married	70	70	82	82
	Separated	6	6	4	4
	Divorced	5	5	2	2
	Widowed	1	1	0	0
Residence	Urban	64	64	32	32
	Rural	36	36	68	68
Educational status	Illiterate	36	36	46	46
	Completed primary school	29	29	25	25
	Completed secondary school	15	15	16	16
	Above secondary school	18	18	13	13
Income	1000-2500 birr	17	17	37	37
	2501-4500 birr	30	30	42	42
	4501-6500 birr	39	39	15	15
	greater than 6500 birr	14	14	6	6

Table 1: Socio-demographic characteristics of outpatient attendants at public hospitals in Gamo Gofa Zone Southern Ethiopia September 2013(n=100).

Prescription indicators

A total of 1198, prescriptions were used for the evaluation of the prescribing pattern from two hospitals; 600 From Arba Minch General Hospital and 598 from Chencha District Hospital. From total prescriptions examined in Arba Minch hospital 269(44.83%) contained one drug per prescription, 224 (37.3%) contained two drugs per prescription and 84 (14.00%) contained three drugs per prescription. On the other hand from total prescriptions evaluated in Chencha

Hospital 207 (34.62%) contained one drug per prescription, 268 (44.82%) contained two drugs per prescription and 79 (13.21%) contained three drugs per prescription. The average number of drugs per prescription was 1.77 in Arba Minch and 1.95 in Chencha Hospital ranging from 1 to 5 drugs per prescription. Regarding route of administration majority of patients in both hospitals were treated with orally followed by injections. Antibiotics were the most commonly prescribed drugs in both hospitals 292 (48.67%) and 360 (60.20%) respectively. All drugs are prescribed by their generic name from essential drug list of Ethiopia and only 484 (45.5%) of prescribed drugs in Arba Minch General hospital and 628 (53.9%) of prescribed drugs in Chencha hospital were actually dispensed to the patient (Table 2).

Commonly prescribed antibiotics	Arba Minch General Hospital (n=600)		Chencha District Hospital (n=598)	
	Frequency	Percent	Frequency	Percent
Number of drugs per prescription				
One	269	44.83	207	34.62
Two	224	37.33	268	44.82
Three	84	14	79	13.21
Four	20	3.33	34	5.69
Five	3	0.5	10	1.67
Route of administration				
Oral	514	85.67	522	87.29
Injection	62	10.33	58	9.7
Rectal	18	3	13	2.17
Vaginal	6	1	5	0.84
Commonly prescribed drugs				
Antibiotics	292	48.67	360	60.2
Cardiovascular dugs	108	18	78	13.04
Antidiabetics	45	7.5	23	3.85
Anti-protozoals	102	17	94	15.72
Anti-helmentics	32	5.33	25	4.18
GIT drugs	21	3.5	18	3.01

Table 2: Prescription practice indicators at public hospitals in Gamo Gofa Zone Southern Ethiopia September 2013.

Commonly prescribed antibiotics

The most commonly prescribed Antibiotics in Arba Minch Hospital were Ciprofloxacillin 81(27.74%), Amoxicillin 75(25.68%) and Erythromycin 32(10.96%). While most commonly prescribed Antibiotics in Chencha Hospital were Ciprofloxacillin 118(32.78%), Doxycycline 80(22.22%) and Cotrimoxazole 26(7.22%) (Table 3).

Commonly prescribed antibiotics	Arba Minch General Hospital (n=292)		Drugs	Chencha District Hospital (n=360)	
	Frequency	Percent	Frequency	Percent	
Ciprofloxacillin	81	27.74	Ciprofloxacillin	118	32.78
Amoxacillin	75	25.68	Doxycycline	80	22.22
Erythromycin	32	10.96	Cotrimoxazole	26	7.22
Clarithromycin	28	9.59	Metronidazole	25	6.94
Cephalexin	19	6.51	Amoxacillin	24	6.67
Ampicillin	16	5.48	Clarithromycin	23	6.39

Cotrimoxazole	12	4.11	Ampicillin	22	6.11
Metronidazole	11	3.77	Cephalexin	16	4.44
Doxycycline	10	3.42	Cloxacillin	14	3.89
Cloxacillin	8	2.74	Erythromycin	12	3.33

Table 3: Top ten antibiotics prescribed in outpatient departments at public hospitals in Gamo Gofa Zone Southern Ethiopia September 2013.

Commonly prescribed injections

Regarding the most commonly used injection medication, Diclofenac sodium is major one 39 (62.90%) followed by procaine penicillin 8 (12.90%) in Arba Minch General Hospital. While in Chencha District Hospital, Procaine Pencillin 39 (67.24%) followed by Diclofenac Sodium 7 (12.07) were commonly prescribed injection medications (Table 4).

Commonly prescribed injections	Arba Minch General Hospital (n=62)		Drugs	Chencha District Hospital (n=58)	
	Frequency	Percent		Frequency	Percent
Diclofenac Sodium	39	62.90	Procaine penicillin	39	67.24
Procaine penicillin	8	12.90	Diclofenac Sodium	7	12.07
Cloxacillin	7	11.29	Cloxacillin	6	10.34
Cimetidine	5	8.06	Cimetidine	5	6.90
Tramadol	3	4.84	Tramadol	5	3.45

Table 4: Commonly used injection medications prescribed at public hospitals in Gamo Gofa Zone Southern Ethiopia September 2013.

Patient care indicators

Data from patient exit interview showed that all most all patients knew the dosage of drugs dispensed to them, more than 80% of them knew frequency of administration and only 60% of patients from Arba Minch hospital and 52% of patients new special precautions regarding medicines prescribed for them. The overall knowledge on drugs dispensed was 60% in Arba Minch Hospital and 52% in Chencha Hospital (Figure 1).
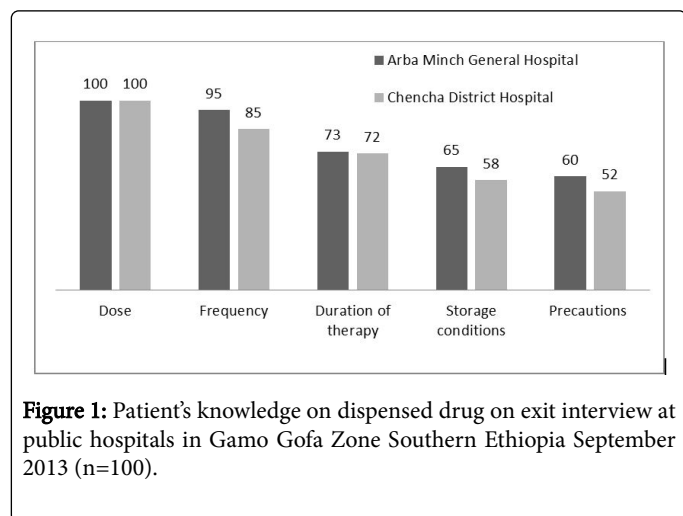

Figure 1: Patient's knowledge on dispensed drug on exit interview at public hospitals in Gamo Gofa Zone Southern Ethiopia September 2013 (n=100).

Labelling information: Observation during exit about contents of label showed that all labels contain the generic name of drugs, below half of labels contain name of patient. While none of the labels contain information on frequency of administration, storage conditions, expiry date and special precautions. Overall labelling information was not adequate for all prescriptions dispensed to patients in both hospitals during study period (Table 5).

Information available on label	Arba Minch General Hospital (n=100)	Chencha District Hospital (n=100)
	Yes	Yes
Patient name	42	34
Generic name	100	100
Strength	28	23
Dose	17	12
Quantity dispensed	35	28
Frequency of administration	0	0
Direction for use	8	5
Storage conditions	0	0
Expiry date	0	0
Special precautions	0	0

Table 5: Distribution of Information found on Label of dispensed drug observed during exit interview at public hospitals in Gamo Gofa Zone Southern Ethiopia, September 2013.

Facility indicators: Out of 30 key essential drugs only 25 (83.33%) were available in Arba Minch General Hospital and 19 (63.33%) were available during study period. Both of the hospitals had a copy of essential drug list and drug formulary and drug and therapeutics committee which advises health professionals and patients on drug related issues. Both Hospitals had no antimicrobial stewardship committee (Tables 6 and 7).

Essential Drugs	Strength	Availability	
		Arba Minch	**Chencha**
Acetylsalicylic acid Tablet	71 mg, 75 mg and 81 mg	√	√
Activated Charcoal Tablet	125 mg, 250 mg	X	X
Adrenaline Injection	0.1 mg/ml	√	√
Albendazole tab	200 mg	√	X
Aminophylline Injection	250 mg /10 ml in 10 ml& 20 ml	√	√
Amoxacillin suspension/tab	125 mg/5 ml; 250 mg, 500 mg	√	√
Atropine Sulfate Injection	1 mg/ml in 1 ml ampoule	√	√
Arthemether+Lumefantrine tab	120+20 mg	√	√
Cotrimoxazole tab/suspension	240 mg/5 ml, 480 mg	√	√
Dextrose Injection	5% in 1000 ml, 10% in 1000 ml	√	X
Diclofenac Injection	25 mg/ml in 3 ml ampoule	√	X
Ergometrine Maleate Injection	0.25 mg/ml, 0.5 mg/ml	X	X
Hydralazine Injection	20 mg/ml in 1 ampule	√	√
Chloroquine tab	250 mg	√	√
Iodine+KI (Lugol's solution)	5%+10%	√	X
Magnesium Sulfate Injection	2%, 5%, 10%, 20%, 50%	√	√
Metoclopramide Drops/injection, tab	0.2 mg/drop, 5 mg/ml, injection	√	√
Ferrous sulphate+Folic acid tab	-	√	√
Oral Rehydration Salt Powder	Sachet	√	√
Oxytocin Injection	1 unit/ml, 5 unit/ml, 10 unit/ml	√	√
Prednisolone tab	5 mg	√	X
Promethazine Injection	25 mg/ml	X	X
Propranolol Hydrochloride Injection	1 mg/ml	X	X
Rabies Antiserum	200 units in 5 ml	√	√
Ringer's Lactate solution	1000 ml	√	√
Salbutamol Oral inhalation	0.1 mg/dose; Nebulizer solution	√	√
Snake Venoum Antiserum Injection	10 ml	√	X
Sodium Chloride Injection	0.9% in 1000 ml, 3% in 500 ml	√	√
TTC Eye drop/ointment	0.5%, 1%	X	X
Vitamin K Injection	10 mg/ml in 1 ml ampoule	√	√
Note: - "√": Available and "x": Not available			

Table 6: Distribution of availability of key essential drugs at public hospitals in Gamo Gofa Zone Southern Ethiopia September 2013.

WHO drug use indicators		Arba Minch Hospital	Chencha Hospital
Prescribing indicators	Average number of drugs per encounter	1.77	1.95
	Percentage of drugs prescribed by generic name	1064 (100%)	598 (100%)
	Percentage of injections prescribed	62 (10.33%)	58 (9.70%)
	Percentage of antibiotics prescribed	292 (48.67%)	360 (60.20%)
	Percentage of drugs actually dispensed	484 (45.5%)	628 (53.9%)
	Percentage drugs prescribed from drug list	1064 (100%)	1166 (100%)
Patient care indicators	Average consultation time in minutes	3.82 (Min)	3.66 (Min)
	Average dispensing time in minutes	1.18 (Min)	1.33 (Min)
	Percentage of drugs actually dispensed	484 (45.5%)	628 (53.9%)
	Percentage of drugs adequately labelled	0%	0%
	Patient's knowledge on prescribed drug	60 (60.0%)	52 (52.0%)
Facility indicators	Availability of Essential drug list	1	1
	Availability of Drug formulary	1	1
	Percentage of Availability of key drugs	25 (83.33%)	19 (63.33%)
	Availability Drug and therapeutics committee	1	1
	Availability of Antimicrobial stewardship committee	0	0
Note:- "1= Yes" and "0= No"			

Table 7: Distribution of WHO drug use indicators at public hospitals in Gamo Gofa zone southern Ethiopia September 2013.

Discussion

This study revealed that the average number of drugs per prescription was 1.77 in Arba Minch General Hospital and 1.95 in Chencha Hospital. The slight increase in Chencha Hospital could be due to variation in prescribers experience because Arba Minch Hospital is General Hospital and there are experienced and physicians and other candidate prescribers. Generally the average number of drugs per prescription is similar to WHO recommendation on rational use of drugs (1.6-1.8) drugs per encounter [19] and Hawassa referral hospital 1.9 drugs per encounter [20].

In this study injection use was found to be 62 (10.3%) in Arba Minch Hospital and 58 (9.7%) in Chencha Hospital which is comparable to the WHO standard value i.e. 13.4-24.1% [19] and report from south West Ethiopia (11.07%) [21]. However it is lower than study done in Hawasa referral hospital 38.1% [20]. This variation could be explained by difference in distribution of disease pattern and level of care provided by professionals. The reduction of percentage of encounters with injections may have an advantageous in reducing the possibility of transmissions of blood born infections like HIV, and hepatitis [22].

The average percentage of patients receiving one or more antibiotics in the hospitals were 292 (48.67%) and 360 (60.20%) in Arba Minch and Chencha Hospital respectively. However this is higher than the WHO standard value 20.0-26.8. This could be explained by variation in geographical location, disease distribution being developing country infectious disease is more prevalent which necessitates Antibiotic prescription while WHO standard Value is average value.

This study also revealed that all drugs were prescribed by generic name in both hospitals. This is in line with WHO guideline which expects 100% of drug prescription to be generic. Increasing generic prescription could substantially reduce the cost of drugs for patients and the cost for facilities. Generally, generic prescription is an indicator of prescribing quality and the cost of prescribed medications can determine the level of compliance [23].

All drugs were prescribed from list of national essential drug list in this study. This is similar to study in Jimma University specialized Hospital, almost all drugs prescribed for the health problems were on the essential drug list of the country, but few drugs prescribed out of the list were found in the national drug list of Ethiopia [20].

The overall knowledge on drugs dispensed was 60% in Arba Minch Hospital and 52% in Chencha Hospital. Number factors could be a reason for this barrier such as educational background, cultural factors physical factors such as noises and etc. Moreover, the short dispensing time by itself could be a factor, because the clients have no enough time to get enough information about the drugs they have been dispensed [24].

In this study the average consultation and dispensing time in facilities was 3.82 minute and 3.66 minutes respectively. The probable reason for such smaller time could be the large number of patient flow for which the doctors and pharmacy professionals urged to cover, and the smaller number of manpower. The findings from this study were

smaller than the study conducted in South West of Ethiopia 6.14 minute and 1.28 minute respectively [25].

In this study none of labels for the drugs dispensed were adequately labelled. According to WHO a label to be adequate it should contain at least patient name, drug name, strength, dosage (dose and frequency) and duration/quantity of the drug. However findings from similar studies showed that practice of adequate labelling was 67% [26-28]. It could be explained by high patient flow and inadequacy of knowledge and skill in labelling of prescribed drugs could be the major factor for these low results.

Percentage of drugs actually dispensed in this study was 484 (45.7%) and 628 (53.9%) respectively. This is lower than similar studies conducted in North West Ethiopia and in different other countries like Nigeria and Colombia. It could be directly related to inadequate availability of essential drugs. Studies showed that good drug and medical supply management insures continuous supply of drugs and prevents frequent stock outs and wastages [11,26-31].

Limitations of the Study

The findings of this study should be interpreted in light of its limitations. Being cross sectional and retrospective study there might be desirability and information bias; the study was limited in that it was not designed to reveal the factors determining rational drug use.

Conclusions and Recommendations

Conclusions

In our study there was no adequately labelled prescription; low average consultation and dispensing time. About one half of prescribed drugs were actually dispensed to the patients, which were an indicative of frequent stock outs and poor supply management in the facilities. Less than two third of patients had adequate knowledge on drugs dispensed to them. There was no antimicrobial stewardship committee in both hospitals. All drugs were prescribed by generic name from essential drug list and more three forth of key essential drugs were available in the General hospital and about two third of key essential drugs were available in the District hospital.

Recommendations

Based on the findings of this study the following recommendations were made; Zonal health department along with respective hospitals should design strategies to:-

- Improve labelling of prescribed drugs through providing training to pharmacy professionals about labelling and its importance
- Strengthen DTC function and establishing antimicrobial stewardship committee by motivation and empowering staffs to bear extra duties
- Improve availability of key essential drugs on stock through good drug supply management and training on drug supply management
- Improve patient knowledge on prescribed drugs through, improving patient counselling during dispensing
- Further study should also be done to dig out factors contributing irrational drug uses.

Competing Interests

There is no financial or personal relationship(s) which may have inappropriately influenced them in writing this article.

Authors' Contributions

Mende Mensa, conceived the study, analysed the data and prepared the draft for publication and polished the language. Tarekegn Tadesse and Akililu Ayele participated in data analysis and approved the final manuscript.

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