ORIGINAL RESEARCH

Drug utilization in selected health facilities of South West Shoa Zone, Oromia Region, Ethiopia

Mengistu Kebede
Dereje Kebebe Borga
Eshetu Mulisa Bobasa

Department of Pharmacy, Jimma University, Jimma, Ethiopia

Background: Sustaining the availability and rational use of safe and effective drugs is a major problem in developing countries. Irrational drug use affects quality of health care more than accessibility of drugs.

Objective: To assess drug utilization in selected health facilities of South West Shoa Zone, Oromia Region, Ethiopia.

Methods: A cross-sectional study was conducted in selected health facilities of South West Shoa Zone from January 21–28, 2012 by using structured questionnaires.

Results: Of 50 prescribers and 30 dispensers, 58% and 83.3% were males, respectively. The result showed that majority of prescribers agreed on availability of essential drugs (72%) and had access to up-to-date drug information (76%). However, 43.3% of dispensers didn't get access to up-to-date drug information. 86% and 88% of prescribers note cost of drugs and stick to standard treatment guidelines of Ethiopia during prescription, respectively. All drug dispensers check the name of the drug (100%), age of the patient (90%), the dosage form of drug (96.7%), the route of administration (90%), the duration of therapy (86.7%), and frequency of administration (86.7%) for prescription papers.

Conclusion: In general, drug utilization at the study sites was found to be good, although there are major deviations from the concept of rational drug use.

Keywords: drug utilizations, rational drug use, health facilities

Introduction

The World Health Organization (WHO) addressed drug utilization as "healthcare provider prescribing, pharmacist dispensing, and patient use of medications considering its consequences; medical, social, and economic impacts."[1] Thus, the focus of drug utilization is related to factors such as prescribing, dispensing, administering, and taking of medications. "Health providers and pharmacists can only master the prescribing and dispensing of a limited number of drugs. High-quality drug utilization is therefore associated with the use of a relatively limited number of pharmaceutical products".[2] These important and relevant drugs are called essential medicines. Essential medicines are described as "those that satisfy the priority health care needs of the population. They are selected with due regards to public health relevance, evidence on safety, efficacy, quality and comparative cost-effectiveness. They are intended to be available within the context of functioning health systems at all times in adequate amount and appropriate dosage forms with assured quality."[3] As a result, delivery of quality health service should be supported with regular availability of essential medicines at an affordable price while ensuring their proper prescription and dispensing to patients. Preparing and using essential medicine list is one of the 12 core

Correspondence: Eshetu Mulisa Bobasa
Department of Pharmacy,
Jimma University, PO Box 378,
Jimma, Oromia, Ethiopia
Tel +251 93 246 7361
Email mulisa2e@yahoo.com

strategies adopted by WHO to control the appropriate use of medicines.[4] Even though the concept of essential medicine list was introduced in 1985 to Ethiopia, there are still irrational uses of drugs, which is further complicated by medicines shortage and low budget.[5]

The prescriber, the dispenser, the patient (client), the health care system, and pharmaceutical institutions are the major role players in the use of drugs.[6] In particular, prescribers and dispensers should provide patients clear information so as to maximize therapeutic effect and prevent adverse consequences during therapy.[5] Inappropriate utilization of medicines is more common in developing countries as there are lack of well trained health professionals along with their attitude and belief towards rational drug use. Such practices are one of the major factors contributing for wastage of scarce financial resources for health.[7] In Ethiopia, irrational use of medicines is common in health facilities and the patient.[5] Therefore, the aim of this study was to assess the views of health professionals concerning the utilization of drugs in health facilities and retail drug outlets of South West Shoa Zone, Oromia Region, Ethiopia.

Methods

The data was collected between January 21 and 28, 2012 from prescribers and dispensers of selected health facilities in South West Shoa Zone. The zone has 2 hospitals, 47 health centers, 38 medium and small clinics, 268 health posts, 2 pharmacies, 8 rural drug vendors, and 16 drug stores. The two hospitals have four pharmacies, namely, inpatient, outpatient, antiretroviral therapy, and store pharmacy, and the health centers have outpatient, antiretroviral therapy (some), and store pharmacy. Simple, random sampling technique using lottery method was used to select the health facilities from each category. The study area sites were Tulu Bollo Hospital, Tulu Bollo Health Center, Woliso Health Center, Harbu Chululie Health Center, some private clinics, all pharmacies of the selected government health facilities, drug stores, and rural drug vendors.

A cross-sectional study was carried out using structured questionnaires consisting of open- and close-ended questions to collect the information on sociodemographic characteristics and drug utilization from prescribers and dispensers. After reviewing the literature, well-structured data collection forms were developed to make the language more clear. The data-collection forms were further developed after pretesting was done in a small portion of dispensers and prescribers (two or three) before the beginning of the data collection. All prescribers and dispensers working in selected hospitals,

health centers, pharmacies, clinics, drug stores, and rural drug venders in South West Shoa Zone were our source populations. Those that were present at the time of data collection filled self-administered questionnaires concerning age, sex, occupational status, availability of essential drugs, accessibility of up-to-date drug related information, proper delivery of drugs, adequacy of label on dispensed drugs, and availability of standard treatment guidelines, formularies, and essential drug lists. The variables were selected based on rational drug use studies,[5–7] and by using key interventions mentioned by the WHO to promote rational drug use.[4] The principal investigator supervised closely the filling of the questionnaires by dispensers and prescribers. The collected data was fed to SPSS 16 and presented using tables and figures.

The ethical research committe of the pharmacy department, College of Public Health and Medical Sciences, Jimma University approved the study. Then, written informed consent was prepared for approval by review board, and approval was secured. Finally, officials at different levels in the selected health facilities (Tulu Bollo Hospital, Tulu Bollo Health Center, Woliso Health Center, Harbu Chululie Health Center, some private clinics, all pharmacies of the selected government health facilities, drug stores, and rural drug vendors) were contacted and letters of permission were presented. After the purpose of the study was explained, the participants gave their written informed consent to fill self-administered questionnaires. Confidentiality of the information was assured, privacy was maintained, and the record was filed in the document.

Results

The questionnaires were distributed to 50 prescribers and 30 dispensers to assess drug utilization practices. Of 50 prescribers, 29 (58%) were males and 21 (42%) were females. Of them, 7 (14%), 19 (38%), 6 (12%), 17 (34%), and 2% were general practitioners, health officers, Bachelor of Science nurses, diploma nurses, and dentist, respectively. Pharmacists, druggists, and pharmacy technicians comprised 33.3%, 50%, and 16.7%, respectively, as shown in Table 1.

Drug utilization assessment from prescribers' side showed that 72%, 76%, 86% and 88% of prescribers confirmed availability of essential drugs, had access to up-to-date information, checked the price of drugs, and followed standard treatment guidelines of Ethiopia, respectively. Only 56% of prescribers' believed in the success of treatment. While prescribing, only 46% agreed on the equality of local and import medicine (Table 2).

Table 1 Sociodemographic characteristics of prescribers (n=50) and dispensers (n=30), January 2012

	Prescribers n (%)	Dispensers n (%)
Sex		
Male	29 (58)	25 (83.3)
Female	21 (42)	5 (16.7)
Total	50 (100)	30 (100)
Age		
<25	15 (30)	4 (13.3)
25–34	29 (58)	21 (70)
35–44	5 (10)	3 (10)
45–54	1 (2)	2 (6.7)
>55	0	0
Total	50 (100)	30 (100)
Qualification		
General practitioner	7 (14)	
Dentistry	1 (1)	
Health officers	19 (38)	
BSc nurses	6 (12)	
Diploma nurses	17 (34)	
Pharmacist		10 (33.3)
Druggist technician		15 (50)
Pharmacy technician		5 (16.7)
Total	50 (100)	30 (100)

Abbreviation: BSc, Bachelor of Science.

The majority of the prescribers adhere toward correct prescription writing format as evidenced by most of them always prescribing by the generic name (70%), writing the dosage form (86%), writing the age of patients (88%), duration of therapy (90%), frequency of administrations (90%), and considering the therapeutic appropriateness of the indication (66%). However, only 40%, 38%, and 46% of the prescribers always checked drug availability, drug interaction, and other health information, respectively (Table 3).

The response of dispensers to the drug utilization questionnaires indicated that 56.7% of them get up-to date drug information and 42.5% search for new information on drugs after drugs are being marketed (Table 4). Majority of the dispensers got drug information from inserted leaflets, drug formularies, standard treatment guidelines, and books (pharmacology and pharmacotherapy).

With respect to checking correct prescription-writing format, majority of dispensers reported that they always check the name (100%), the age of the patients (90%), the dosage form (96.7%), the route of administration (90%), the duration (86.7%), and frequency of administration (86.7%) while dispensing prescriptions. 73.3% of the dispensers always check the availability of drug in health facility. A significant number of dispensers (56.7%), didn't always explain how to properly store medicines to their patient,

Table 2 Prescribers information related to drugs (n=50), January 2012

Answer	Number	%
Are essential drugs available?		
Yes	36	72
No	14	28
Total	50	100
Reasons for lack of availability of essential drug		
Lack of budget	8	57.1
Lack of responsible professional	4	28.6
Lack of awareness	2	14.3
Do you get up-to-date drug information?		
Yes	38	76
No	12	24
Total	50	100
Do you stick to standard treatment guidelines of Ethiopia?		
Yes	44	88
No	6	12
Total	50	100
Do you take note of drugs' price before prescribing?		
Yes	43	86
No	7	14
Total	50	100
How do you rate adherence of patients to drugs?		
Very good	11	22
Good	24	48
Moderate	15	30
Total	50	100
What do you think is the possibility of success in treatment?		
>75% of patients	28	56
50%–74% of patients	22	44
Total	50	100
Which drug/s do you prefer during prescribing?		
Local	14	28
Imported	13	26
Both	23	46
Total	50	100

despite 53.3% report of always checking of drug interaction during dispensing (Table 5).

While communicating to the patients, most of dispensers label the medication appropriately (frequency [93.3%], route [90%], quantity [90%], duration [66.7%] and use of symbol [70%]) (Table 6).

Discussion

Irrational use of pharmaceuticals is commonly observed in health care systems throughout the world, especially in developing countries. This problem can be solved by making essential drugs available, increasing up-to date drug information, and providing an efficient supply of drugs.[8]

The present study focused on drug utilization pattern of prescribers and dispensers. The responses of the majority of prescribers during the study confirmed availability of essential drugs, access to get up-to date information, consideration

Table 3 Prescribers' correct prescription writing format (n=50), January 2012

Variables	Always		Often		Sometimes (when needed)		Never	
	n	%	n	%	n	%	n	%
Generic name	35	70	14	28	1	2	0	0
Dosage form	43	86	5	10	1	2	1	2
Age of the patient	44	88	5	10	1	2	0	0
Duration	45	90	4	8	1	2	0	0
Frequency	45	90	3	6	2	4	0	0
Availability	20	40	16	32	13	26	1	2
Appropriateness of the indication	33	66	10	20	6	12	1	2
Drug interactions	19	38	14	28	16	32	1	2
Other patient related problems eg, renal failure, hepatic failure, etc	23	46	12	24	13	26	2	4
Previous medication of the patients	24	48	12	24	11	22	3	6

of the price of drugs during prescription, and following of standard treatment guidelines of Ethiopia during prescription. But 48% of them feel good for compliance while little more than half had a belief that more than 75% of patients can be cured upon treatment. Of importance is that less than 50% of prescribers believed that there was no difference between locally manufactured and imported drugs.

In a given health care system, there are four major areas related to drug management: rational use, affordable price, sustainable financing, and reliable health and supply systems. In addition, there should be a dynamic and sustainable pharmacovigilance system. Pharmacovigilance is the science of adverse reaction reporting and monitoring medicines safety. It is very important to ensure safety of medicines from their development to their use in large populations.[9] In other words,

Table 4 Response of dispensers to the questionnaire, January 2012

Response	Number	%
Do you get access to up-to-date drug information (n=30)?		
• Yes	17	56.7
• No	13	43.3
What are your source/s of drug information (n=91)?		
• Inserted leaflets	28	30.8
• Books (pharmacology and pharmacotherapy)	18	19.8
• Formularies and standard treatment guidelines	27	29.8
• Bulletins	13	14.3
• Internet	5	5.5
How do you get new information on drugs (n=40)?		
• After invented (discovered)	3	7.5
• After being marketed	17	42.5
• Reading materials as the drugs brought to dispensary room	10	25
• During addition and deletion from essential drug list	7	17.5
• No search for information	3	7.5

rational drug use means "prescribing right drug, in adequate dose for the sufficient duration and appropriate to the clinical needs of the patient at lowest cost." This can be met if the process of prescribing and dispensing is appropriately followed. But a number of factors may be involved in the rational use of medicines. Despite all the challenges, our study site prescribers do have better performance in drug management by following the country essential drug lists and standard treatment guidelines. They also got up to date information. Essential drugs offer a cost-effective solution to many health problems in a developing country. Prescribers can treat patients efficiently if they have access to essential drugs lists and standard treatment guidelines.[10,11]

The major gap identified at the study sites was that the prescribers believed in adherence, which was 48% good. Adherence is a key determinant in rational drug use, even though drugs were prescribed and dispensed appropriately. The prescribers who responded were also less sure of whether the treatment was successful or not. During management, we have to make wise and evidence-based decisions unless the situation is difficult.[12,13] Otherwise medication errors may increase morbidity, mortality, health care resource wastage, and adverse drug events.[14] Even though the majority (70%) of the prescribers always prescribe by generic name, the requirement by WHO for rational drug use is always 100% prescription by generic name.[15] Prescription by generic name will save the cost incurred by unnecessary brand prescription except in some drugs for which particular attention of concentrations or other factors are needed.[16]

The poor activity of the prescribers is due to their ignorance of previous medications taken by the patients (only 48% always consider previous medication), drug interactions during prescribing (only 38% always consider drug interaction), and other patient-related problems (only

Table 5 Dispensers' checking the correct prescription writing format while dispensing (n=30), January 2012

Variables	Always		Often		Sometimes (when needed)		Never	
	Number	%	Number	%	Number	%	Number	%
Name of drug(s)	30	100	–	–	–	–	–	–
Age of the patient	27	90	I	3.3	I	3.3	I	3.3
Dosage form	29	96.7	I	3.3	–	–	–	–
RDA	27	90	I	3.3	2	6.7	–	–
Duration	26	86.7	2	6.7	2	6.7	–	–
FoA	26	86.7	2	6.7	2	6.7	–	–
ADHF	22	73.3	66	20	2	6.7	–	–
TAPD	I5	50	4	13.3	II	36.7	–	–
Drug interactions	16	53.3	7	23.3	6	20	I	3.3
TPS	13	43.3	8	26.7	7	23.3	2	6.7

Abbreviations: RDA, route of drug administrations; FoA, frequency of administration; ADHF, availability of drug in the health facility; TAPD, therapeutic appropriateness of the prescribed drugs; TPS, telling the proper storage condition to the patient.

46% always consider other patient related problems such as renal failure, hepatic failure, etc). These are the most important and most critical factors in deciding what to prescribe, when to prescribe, and what to expect after prescribing. As can be clearly understood from our study, 66% of the prescribers always consider the therapeutic appropriateness of the indication, but majority lack the knowledge of what appropriate means in pharmacotherapy. It involves not only indication but also consideration of previous medications, drug interactions, and other related complications.[17]

With regard to dispensers, only 56.7% got up-to-date access. To fill their knowledge gap 42.5% accessed new information after the drugs were being marketed. Inserted leaflets, national drug formularies, standard treatment guideline of Ethiopia, and books (pharmacology and pharmacotherapy) were their sources of information. The source of information for the dispensers is almost similar to the source of information mentioned by drug dispensers in Mekele town.[18] The fact that majority of dispensers (30.8%) use inserted leaflets proved the lack of a source of information

for dispensers. WHO promotes use of drug information bulletins rather than leaflets as the latter may contain advertising information rather than real information, except the approved leaflets registered by the regulatory authority of the manufacturer, which carry the real information.[18] Moreover, unlike prescribers, 43.3% of dispensers had no access to up-to-date drug information.

Majority of the dispensers always checked the prescription paper for inclusion of names, age, dosage form of drugs, route of administration, duration of therapy, and frequency of administration. But, less than half of them told the patient about proper storage, and almost half always checked drug interactions during dispensing. Patients, health professionals, and the general public have the right to be given adequate explanations about drugs by dispensers due to constantly new drugs entering the market and so its important that information is kept up-to-date. This description should cover any special instructions such as taking the medicine with food or water. In addition, the label should include storage instructions.[18,19]

The study also showed that dispensers give special attention to pregnant women and children, especially since physiological changes during pregnancy may compromise pharmacotherapy. Such physiologic changes include

Table 6 Dispensers' communication to the patient (n=30), January 2012

Labeling parameters	Remarks			
	Yes		No	
	Number	%	Number	%
Patient's name	8	26.7	22	73.3
Duration	20	66.7	10	33.3
Route	27	90	3	10
Date	12	40	18	60
Frequency of administration	28	93.3	2	6.7
Quantity to be dispensed	27	90	3	10
Use symbolic in case of illiteracy	21	70	9	30

Table 7 Dispensers focus to special patients (n=30), January 2012

Special population	Yes		No	
	Number	%	Number	%
Pregnant women	28	93.3	2	6.7
Children	27	90	3	10
Eye or ear problem	26	86.7	4	13.3
Elderly patients	24	80	6	20
Polypharmacy	23	76.7	7	23.3

Table 8 Dispensers' response regarding the availability of prescribed drugs (medicine) in the pharmacy and how they control expired dates, January 2012

Parameter	Number	%
Check drugs availability at pharmacy has not expired		
• Yes	30	100
• No	0	0
Means of checking for expired drugs		
• LIFO	2	5.4
• FIFO	9	24.3
• FEFO	26	70.3

Abbreviations: LIFO, last in, first out; FIFO, first-in, first-out; FEFO, first expired, first out.

changes in enzyme activity, increment in blood volume, and increased renal output causing general changes in pharmacokinetics of drugs. In addition, drugs may affect the fetus. Therefore, dispensers' consideration of pregnancy during dispensing is supportive for our countries millennium development goal which stated zero mother's death during pregnancy.[20]

Conclusion

In general, drug utilization of the prescribers was found to be good. Majority of the prescribers were aware of essential drugs and had access to up-to date drug information. They also considered price, followed standard treatment guidelines, used generic names, always considered the therapeutic appropriateness of the indication, and used drug formularies as the source of their information during prescribing. However, majority of the prescribers paid less attention to patient compliance, did not always consider availability of drugs, did not always look at appropriateness, drug interactions, and other related patient problems. Their belief on success of treatment was also not satisfactory. Half of the dispensers got up-to-date drug information, even though this value is lower than that of the prescribers. Majority of the dispensers got drug information from inserted leaflets, drug formularies, standard treatment guidelines, and books (pharmacology and pharmacotherapy). Also, majority of dispensers checked for correctness of prescription and communicated with patients appropriately. Drug utilization is a very complex and multifactorial process. As a result, the study-site drug utilization patterns did not meet the standards of the WHO. However, this can be achieved by involving stakeholders like health science departments, Ministry of Health, Food, Medicine and Healthcare Administration and Control Authority of Ethiopia (FMHACA), pharmaceutical manufacturers and distributors, non-governmental organizations, health profession councils and associations, and all health professionals in the rational use of medicines.

Therefore, we recommend the following points:

- Training should be arranged for both dispensers and prescribers in order to enhance their skill in dispensing and prescribing.
- There should be awareness of all levels of drug utilization with respect to the global concern of antimicrobial resistance going through all levels from the drug manufacturer through to the patient.
- Information should be disseminated to the public about the importance of compliance with treatment regimens, especially within the context of the global problem of antimicrobial resistance.
- There should be establishment of dynamic pharmacovigilance, with respect to the reporting and acting upon adverse drug reactions that also include failure or lack of efficacy of drugs.
- Essential drugs use, their supply, and currently evolving findings on them should be conveyed to the students at tertiary levels through pharmacology course and established drug and therapeutic committees.
- Essential drugs should be available in health centers and hospitals.
- Further research should be done nationally to explore rational use of drugs in Ethiopia.

Disclosure

The authors report no conflicts of interest in this work.

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