ASSESSMENT OF LABELING AND PATIENT KNOWLEDGE OF DISPENSED DRUGS AS PATIENT CARE INDICATORS IN ADULALA HEALTH CENTER OUTPATIENT PHARMACY, ADULALA, EAST SHOA, OROMIYA REGION, ETHIOPIA

BY

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Abstract

Background: - The main function of a label on dispensed drug is to uniquely identify the contents of container and to ensure that patients have clear and concise information about the use of the drug. Lack of knowledge and information by the patient about the dispensed drug (the drug they take) leads to incorrect use which in turn results in loss of efficacy or occurrence of adverse effect.

Objective: - To assess the quality of labeling and patient knowledge of dispensed drugs in Adulala Health Center outpatient pharmacy.

Method: - Cross sectional prospective study, where by information from each package of drugs dispensed to patient, was examined using previously prepared format/ check list and exit interview was done with patients to assess their understanding of the information provided to them. The data was analyzed using spss16.0 computer program.

Results: Six hundred fifty five drugs were prescribed for 302 patients and 554(84.58%) were actually dispensed and the mean labeling score of the dispensed drugs was found to be 4.41. All of the dispensed drugs were labeled with their name, strength and expiry date. The remaining labeling attributes, patient name, frequency of administration, dose and duration of treatment were written on 4.7%, 33.75%, 74% and 28.7% of the dispensed drugs respectively. The mean patient knowledge score was 2.46. Dose, frequency, duration and reason for use of treatment were recalled in 100%, 79.06%, 36.82% and 29.96% of the dispensed drugs respectively. The mean dispensing times was found to be 151.85sec.

Conclusion: -The study showed that dispensed medications had poor labeling. Adequate patient knowledge score was not found. Educational level and patient age have strong association with patient knowledge on dispensed drug whereas sex has no association with patient knowledge. Dispensing time was short. Not all prescribed medications are dispensed.

Keywords: Labeling, Drugs, Patient care indicators, East shoa, Oromiya, Ethiopia.

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Table of Content

Contents **Page**

Abstract....I
Acknowledgement.... II
List of tables.... V
Definition of terms.... VII
Abbreviations....IX
1. Introduction....1
1.1 Background.... 1
1.2 Statement of the problem.... 3
1.3 Significance of the study.... 4
2. Literature review....5
3. Objectives....12
3.1. General objective.... 12
3.2. Specific objectives.... 12
4. Method and materials....13
4.1. Study area.... 13
4.2. Study period.... 13
4.3. Study design.... 13
4.4 Population.... 13
4.4.1 Source population....13
4.4.2 Study population....14
4.5 Sampling technique.... 14
4.6 Data collection.... 14
4.7 Study variable.... 14
4.8 Quality assurance.... 15
4.9 Data analysis and presentation.... 15
4.9.1 Calculation of scores....15
4.9.2. Calculation of indicators....16
4.10. Ethical Consideration.... 17

4.11. Limitation of the study 17
5. Result 18
5.1 Socio-demographic characteristics of the patients 18
5.3 Patient knowledge 19
5.4 Labeling pattern of dispensed drugs 20
5.5 Class of medications dispensed in different patient age group 22
5.7 Patient knowledge on dispensed drugs and their age group 23
5.8 Patient knowledge on dispensed drug and their educational status 24
5.9 Dispensing time 25
6. Discussion 28
7. Conclusion 31
9. Reference 33
Annex I: Questionnaire 35

List of tables

Table 1 Background information of patients served at Adulala health center outpatient pharmacy, East shoa, Oromiya region, Ethiopia, January 23 - February 7, 2014. …….18

Table 2 Class of drugs dispensed to patients at Adulala health center outpatient pharmacy East shoa, Oromiya region, Ethiopia, January 23 - February 7, 2014…….19

Table 3 Patient knowledge on dispensed drugs at Adulala health center outpatient pharmacy, East shoa, Oromiya region, Ethiopia, January 23 - February 7, 2014……..…20

Table 4 Labeling pattern of dispensed drugs at Adulala health center outpatient pharmacy, East shoa, Oromiya region, Ethiopia, January 23 - February 7, 2014……....21

Table 5 Number of different medication dispensed in each patient age group in Adulala health center outpatient pharmacy, East shoa, Oromiya region, Ethiopia, January 23 - February 7, 2014……..……22

Table 6 Patient knowledge on dispensed drugs and sex in Adulala health center outpatient pharmacy, Eastshoa, Oromiya region, Ethiopia, January 23 - February 7, 2014…….……23

Table 7 Patient knowledge on dispensed drugs and their age group in Adulala health center outpatient pharmacy, East shoa, Oromiya region, Ethiopia January 23 – February 7, 2014…….....24

Table 8 Patient knowledge on dispensed drug and their educational status in Adulala health center outpatient pharmacy, East shoa, Oromiya region, Ethiopia, January 23 - February 7, 2014……..25

Table 9: Dispensing time at Adulala health center outpatient pharmacy, East shoa, Oromiya region, Ethiopia, January 23 - February 7, 2014…….……26

Definition of terms

Dispensing: The process of preparing and handing out medicine to named person on the basis of prescription which requires the correct interpretation of the wishes the prescriber and the accurate preparation and labeling of medicine for use by the patient as advised.

Dispensing Time: - patient and dispenser communication time.

Dose: - carefully measured quantity of a drug that is prescribed by a doctor to be taken by a patient at any one time.

Drug: - any substance that affects the structure of functioning of a living organism.

Duration of treatment:- how long the drug is taken.

Frequency of administration:- How often the drug is taken.

Illiterate: - Those who cannot read and write.

Label: - a display of written, printed, or graphic matter upon the immediate of any article or upon the outside container or wrapper, if any there be, of the retail package of such article.

Labeling: - all labels and other written, printed or graphic matter upon any article or any of its container or wrapper or accompanying such article.

Patient: - According to this study patient is the person who is taking a prescribed medicine from pharmacy.

Patient knowledge: - The measure of the effectiveness of the information given to patient on drugs schedule.

Percentage of drugs actually dispensed:- the measuring of the adequacy and ability of the facility to provide prescribed drug.

Percentage of drugs actually labeled: - the measure of the extent to which the dispenser records essential information on drug.

Pharmacist: - Those who are educated and licensed to dispense drugs and to provide drug information as they are experts on medications.

Pharmacy: - Drug selling premise that should be run by a pharmacist.

Prescription: - An order for medication issued by a physician, dentist, or other properly licensed medical practitioner.

Score: - a value given in numeric to classify the labeling quality of the dispensed drug and knowledge of the patient.

Strength: - amount of active ingredient responsible of the pharmacologic effect present in a given organism.

Abbreviations

ART	Antiretroviral Therapy
DOTS	Directly Observed Treatment, Short course
HC	Health center
JUSRP	Jimma University Student Research Program
SPSS	Statistical Package for The Social Sciences
WHO	World Health Organization

1. Introduction

1.1 Background

Rational prescription and use of drugs has been a concern in both developed and developing countries during the last two decades and has been promoted by world health organization and other. Within drug use programs, efforts have been concentrated on ensuring rational prescribing habits and the quality of dispensing and patient knowledge of drug has been over looked. Dispensing that is the process of preparing and handing out medicine to a named person on the basis of the prescription which requires the correct interpretation of the wishes of the prescriber and the accurate preparation and labeling of medicine for use by the patient as advised. Any error or failure in the dispensing process can affect the care of the patient [1].

The rational use of drugs requires that patient receive medications appropriate to their clinical needs, in a dose that meet their own individual requirements, for an adequate period of time, and at a lowest cost to them and their community. Rational use of drugs is a complex issue demanding mainly an integrated action of drug prescribers, dispensers and users (patients). It may even extend to the level of health administrators and policy makers [2].

The main functions of a label on a dispensed drug are to uniquely identify the contents of the container and to ensure that patients have clear and concise information about the use of the drug. Each dispensed drug must be appropriately labeled to comply with legal and professional requirement [2].

The labeling on a dispensed drugs should indicate clearly the name, strength and dosage form of the preparation, the name and address of the pharmacy, the patient for whom it has been prescribed, Storage condition and shelf life (use by date) of the medicine, date of supply, give precise details as to the contents of the container when dispensed, and give the patient clear and complete instruction on how and when to take the medicine [2].

Health professionals have important role in patient education, and they should give clear and safe information about drugs, ranging from their therapeutic and adverse effect to delivery times and routes [3].

Simplest form of patient education is counseling at the time of dispensing the prescribed drug. At minimum patients should know how to take their medicine, how often, what to do if a dose is missed, and what side effects to watch for and how to store the medication. Failures in dispensing process, which include proper labeling of drugs and patient counseling, mean that one of the last links in safe use of drug has been breached [3].

1.2 Statement of the problem

Irrational dispensing practice like dispensing of prescription only drugs at partial dose and even without prescription, poor labeling of the dispensed drugs, lack of patient counseling, incomplete compiling and recording of prescriptions and charging patients unreasonably high price for dispensed items are common in developing countries [3].

Lack of knowledge and information by the patient about the dispensed drug (the drug they take) leads to incorrect use which in turn results in loss of efficacy or occurrence of adverse effect [3].

In 1999 the committee on quality of health care in America report highlighted the fact that medication error cause over 7000 deaths per year and results in adverse effect in patients [11].

The quality of dispensing is affected by dispensing time, percentage of drugs actually dispensed and the percentage of drugs adequately labeled. In addition, patient knowledge is one of the essential prerequisites for patient compliance with treatment, which is determined by the quality of consultants and information about the prescribed medicines given by the consulting health workers. The person dispensing the medicine is in a position to reinforce this information [1].

In Ethiopia, it is common to see the dispensed drugs without a label, incomplete label, or illegible label. The size of the commonly used paper may not even allow writing the required information on it [3].

Although the problems are common in Ethiopia the actual status is not known. So, the purpose of this study is to asses labeling and patient knowledge of dispensed drugs as patient care indicator in Adulala Health Center outpatient pharmacy, Adulala, East shoa, Oromiya Region.

1.3 Significance of the study

Most of the health budget is allocated for pharmaceuticals in developing countries. Undertaking safe, organized and efficient drug dispensing system is essential for controlling costs and assuring that the medical prescription is safely followed. Following good dispensing system is a useful tool in reduction of medication errors [4].

Even though there are different health institutions which are dispensing prescribed drugs, so far, there was no such type of study under taken in Adulala Health Center outpatient pharmacy. Many researchers in developing countries have described drug use as "irrational" documenting cases of suboptimal or unsafe prescribing, unsuitable, in effective supply and consumption of pharmaceutical products.

So this study will be helpful to know the status of governmental owned health center pharmacies about labeling and giving patients with necessary information about the dispensed drugs in Adulala Health Center outpatient pharmacy. This study will try to provide information on the magnitude of the problem and sites that needs to be corrected in labeling pattern and dispensing of drugs to patients. The study will also be used to assess patient knowledge of information provided to them in the dispensary.

2. Literature review

One of the essential prerequisite for patient compliance is good patient knowledge of the medicine prescribed. The dispenser is in a position to reinforce patient knowledge about the drugs dispensed. The quality of labeling applied by dispensers, the time spent informing the patients, and the communication skill of the dispensers can therefore affect compliance rates [1].

Different studies have been done in different countries to know the labeling pattern, the patient knowledge about dispensed drugs and type of professionals involved in the dispensing services.

A base line survey on use of drugs at the primary health care in Bangladesh was conducted. The drug use pattern and the quality of care were assessed in 80 public sector facilities through rural Bangladesh. The average consulting time (54 seconds), the proportion of adequate examination (37%) and prescription of drugs according to standard treatment guidelines (41%) were unsatisfactory. The mean number of drugs prescribed per patient was 1.44. The average dispensing time (23 second) and proportion of patients who correctly understood dosage (55%) were poor. Finally the researchers recommended that similar surveys should be undertaken to cover the private health sectors, to monitor inpatient prescribing and care and to investigate the drug use pattern in medical colleges and teaching hospitals [4].

Patients concerning the drug they received must be improved in order to guarantee a more rational use of medicines. They also recommended that drug information should, be provided with all necessary details (name, dosage, duration of therapy, time of intake, expiry date) to assure. A study was conducted on evaluation of availability, accessibility and prescribing pattern of medicines in five provinces of the Islamic republic of Iran using WHO indicators. In the study, the quality of the patient information about drug use was measured using two indicators: quality of drug labeling and patient knowledge. The correct drug labeling criteria for prescription (drug name, dosage and expiry date) were met in 84% of the prescription on average. The criteria for an adequate patient knowledge

about the dispensed drug (able to recognize the drug, its indication and use) were met for only for 60% of patients. The survey conformed that the good availability of essential drug in the public pharmacies and affordability of drugs was very good. The investigators indicated areas for improvement [5].

Another study was conducted in Yugoslavia at city of Kvagujavac to compare the service quality in public and private pharmacies by measuring patient care and health facility indicators. The results showed that the average drug dispensing time ranged from 20.5 to 48.2 seconds, being significantly longer in private (21.1 – 48.25) than in public pharmacies (20.1 – 33.7 second). The percentage of actually dispensed drugs raged form 30% to 74% and availability of key drugs raged form 67% to 93% with no significant difference was between public and private pharmacies. There was a serious negligence in labeling the dispensed drugs in both public and private pharmacies, not a single drug package was labeled according to world health organization recommendations. Key drugs were highly available in public and private pharmacies [6].

A study on evaluation of drug use in Jordan using world health organization's patient care and health facility indicators, showed that both the mean time spent on physician patient consultations (3.9 min) and mean pharmacy dispensing time (28.8 seconds) were short, resulting in a mean patient knowledge of prescribed drug dose of 77.7%. The researchers suggested that the base line data gathered by this study can be used by policy makers to monitor and improve pharmaceutical prescribing and consumption practices in Jordan [7].

In Burkina Faso, a study was conducted which mainly focus on the investigation of the quality of drug prescription in nine health centers of three districts in rural health center of Burkina Faso revealed serious deficiencies in drug prescribing that could not be detected by assessing selected quantitative drug use indicators as recommended by WHO only 33% of the patient received information on the duration of the treatment and 68% of the patients could recall the correct dosage of the drugs prescribed [8].

A study was conducted to assess the quality of dispensing and patient knowledge of drugs dispensed in primary care in Botswana. Analysis of data was done from prospective participative observations of the drug dispensing process and interview of patients about their knowledge of drugs received immediately after dispensing. The results of this study showed that the mean labeling score was 2.75. Family Welfare educations and pharmacy technicians scored highest (3.15 and 2.98, respectively) and untrained staff lowest (2.60). Factors independently associated with the labeling score were analgesics versus other drugs, district, health post versus clinics, education of prescribes (nurse best), and years of experience of prescribers (4 – 11 years best). The mean patient knowledge score was 2.50. The reason for prescription of the drugs, dosage, duration of treatment, and name of the drug(s) was recalled in 92%, 83%, 44% and 31% of drugs dispensed, respectively [1].

The researchers finally concluded that only trained dispensing staff provided satisfactory quality of labeling and patients had affair knowledge of the drug dispensed. The knowledge of drugs dispensed by family welfare educators was less satisfactory. The labeling score is a useful indicator of the quality dispensing and knowledge score of both the quality of prescribing and of dispensing. Finally they recommended that these indicators should be added to the WHO list of patient care indicators [1].

Another study was done on assessing prescribing and patient care indicator for children under five years old with malaria and other disease conditions in public health care facilities in Dar-es- Salaam, Tanzania. The result of this study showed that the average number of drugs per prescription in these facilities was 2.3. The overall average dispensing time was 1.4 minutes per patient, of the drugs prescribed 54.7% were dispensed, where as 21.4% of drugs dispense to mothers / guardians were adequately labeled, and 37.2% of mothers know how to administer drugs correctly to their sick children after receiving the drugs from the dispenser. The investigators suggested that the need for educational of drugs, such as anti-malarias, antibiotics, injections, proper dispensing and adequate labeling drugs in packets while the dispensing time for drugs was too short [9].

A study was conducted in Niger on rational drug use and prescribing pattern in 19 health centers. Drug use indicators were measured by retrospective and prospective surveys, achieved before and after a training intervention for nurses is using national standard treatment guideline. The results showed that the average number of drugs prescription increased from 2.96 to 3.14. The averages consultation time were 5.1 to 6.1 minutes for the retrospective and prospective surveys or respectively, and dispensing times were 3.1 and 3.4 minutes, which was longer than those noticed in most of other studies in developing countries. Prescribed drugs were actually dispensed in almost 100% of the cases during the two periods [10].

A study was conducted on rational drug use in nine health centers (HCs) and nine health stations (HSS) in North West Ethiopia. Prescribing, patient care and facility specific factors were measured using drug use indicator with only little exception, the drug use indicators in HCs and HSS and between retrospective and prospective studies were similar despite differences in man power and facilities. The average consultation time in minutes in HSS and HCs was 5.1 and 5.8 respectively, while the dispensing times were 1.5 and 1.9 minutes, respectively. More than 89% of drugs in HCs and 71% in HSs were dispensed from the health facilities, and labeling was satisfactory [11].

In Egypt a prospective cross-sectional study design was carried out to assess the pattern of drug use concerning prescribing, patient care, and facility standards in the selected outpatient clinics in Health Insurance Organization using World Health Organization (WHO) core indicators of drug use in health facilities. Results indicated that as regards patient care indicators, the overall average consultation time was 3.0 minutes, the mean time taken to dispense medications was 16.9 seconds, and the overall percentage of correct patient knowledge of dosage of prescribed drugs was 69.3%. Additionally in all clinics, the percentage of drugs adequately labeled was 0.0%. It was concluded from the study that continuous medical education of doctors at all levels of qualification on rational drug use should be instituted and treatment guides and training courses are recommended emphasizing the importance of adequate labeling and instructions to the patient [16].

A study was done to assess pattern of drug use by using WHO's prescribing, patient care and health facility indicators in selected health facilities in South West Ethiopia. A cross sectional study was carried out retrospectively and prospectively in shebe HC, Yebu HC, Serbo HC and Jimma HC. On evaluation of patient care, using WHO patient care indicators; this study showed that; the mean consultation time spent between the prescriber and patient were 6.50 minute which was the longest at SHHC and 5.47 minutes which was the shortest time spent at YHC. The mean pharmacy dispensing time was 1.23minutes, 1.30minutes, 1.35 minutes and 1.25minutes in SHHC, YHC, SHC and JHC respectively. The average number of drugs prescribed was 2.88 in SHHC which was the highest while 1.80 in JHC which was the lowest compared to other two health centers. The percentage of drugs actually dispensed were 77.22%, 89.04%, 89.55% and 77.77% while the percentages of drugs adequately labeled were71.40%, 73.33%, 67.27% and 68.33% in SHHC, YHC, SHC and JHC respectively. The percentage of patients who knew the dosage of their dispensed medication was 71.40%, 77.14%, 68.50% and 74.28% respectively. In this study the average consultation and dispensing time in facilities was 6.14 minute and 1.28 minutes, which was similar with the study conducted in North West of Ethiopia 5.8 minute and 1.9 minute respectively [13]. However; this result was more different than the study in Niger which was 5.75 minutes and 3.25 minutes in average [10]. The probable reason for this variation may be due to differences in man power, set up of dispensary area and ease access for essential materials like drugs, medical equipment among health facilities

In Ghana, a study was conducted to evaluate the quality of labeling of medicines and determine patient knowledge of the administration of medicines dispensed from community pharmacy revealed of the 280 patients interviewed, 157 (56%) were males. Thirty one (11%) had no education and 99(35%) were secondary school graduates. Antimalarial comprised 17.9% and analgesics, 15.4% of medicines dispensed. The name, quantity, dosage, frequency, duration of therapy and route of administration were written on the label in 98%, 99%, 55%, 54%, 6% and 2% respectively of the dispensed medicines. The mean labeling score was 3.096 (SD=1.05) out of 6. The corresponding patient knowledge values were 63%, 80%, 80%, 75%, 57% and 86%. The mean

knowledge score was 4.375 (SD; 1.38) out of 6. The chi square test p-value for the effect of demographic characteristics (sex, educational background, location) on patient knowledge of medicines dispensed were p=0.454; p=0.000, and p=0.138 respectively. Patient knowledge of the administration of dispensed medicines was rated good; and this largely corresponded with the quality of labeling, except that the duration of therapy and route of administration was not frequently written and so labeling was rated just above average [14].

In India, study was conducted among 20 private practitioners to assess patient care and health facility indicator. A comparative cross-sectional study was conducted among 20 private practitioners, 10 from urban and 10 from rural catchment areas of the training centers of a medical college in Kancheepuram district of Tamil Nadu. The study revealed that average consulting time was 4 minutes, average dispensing time was 2.19 minutes, percentage of drugs actually dispensed was 43% and all the drugs dispensed was adequately labeled, only 22% percentage of patients had knowledge of correct dosage of drugs, the copy of essential drugs lists was not available in any facility and about 73% of the key drugs were available in the health facilities. The average time spent by a patient in the health facility was 18.39 minutes and 93% of the patients expressed satisfaction over the services they received. The study outcome reflects irrational patient care practices among private practitioners in both urban and rural areas. Even though the concept of essential drugs and the benefits of rational use of medicinesare being popularized in the country, the importance of these was not recognized by the doctors and the pharmacists [15].

A study was done on in two selected hospitals of Addis Ababa, Ethiopia to assess duration of labeling by dispensers, to investigate the way information the drug use is communicated to patients and to evaluate the effectiveness of the information. It is institution based cross sectional study where by information from each packages of dispensed to patients were examined using a previously prepared checklist. In addition to evaluating individual packages, exit interviews were made with patients to assess their understanding of the information provided. Structured questionnaire containing both close ended and open ended question assisted the study [11].

The check list on the dispensed packages revealed that 100% of the labels did not include the name of the patient while the name of the drug (product) was indicated on all of them. In 53% of the packages (in both hospitals) dosage forms were given. The strength of the preparations was on 92% and 84%; the frequency of administration was given on 60% the labels issued by hospital I(Black Lion) and Hospital II(St Paulos) respectively [12].

Percentages of patients response to indicators used for evaluating the effectiveness of the information provided to them through label were 38% and 20%, the frequency of administration of the medicament was known by 96% and 80% the duration of the therapy was recalled by 72% and 62% and the storage conditions of the medicament was awarded in 60% and 58% of patients interviewed in hospital I and hospital II respectively. Besides the patient response on the knowledge of dose of the medicament was 20% for both hospitals. The investigators concluded that the labels on the dispensed medicines do not fulfill the requirements of standard label and the information of the label was not fully understood by the patient and suggested that efforts should be made to rectify the deficiencies observed [12].

3. Objectives

3.1. General objective

To assess the quality of labeling and patient knowledge of dispensed drugs among patients visiting Adulala Health Center outpatient Pharmacy, Oromiya Region, Ethiopia.

3.2. Specific objectives

- To assess the quality of labeling of dispensed drugs.
- To assess patient knowledge of dispensed drugs.
- To assess average dispensing time of the pharmacy.
- To assess percentage of drugs actually dispensed.

4. Method and materials

4.1. Study area

Adulala is located 33 (thirty three) kilometer in the south of Bishoftu. The study was conducted on patients coming out from outpatient pharmacy of Adulala Health Center which located in Liban Chukala, East Shoa, Oromiya region. It gives various health services in its departments like Outpatient department, Surgery (minor), Internal medicine, Gynecology and Obstetrics, Ophthalmology, Laboratory and Pharmacy.

4.2. Study period

The study was conducted from January 23 to February 7, 2014.

4.3. Study design

A cross sectional prospective study was conducted to assess the labeling pattern and patient knowledge of dispensed drugs on patients who were taking their dispensed drugs during normal working hours of Adulala Health Center. Information from each package dispensed to the patient was examined using a pre prepared format / check list. In addition, to evaluate individual package, an exit interview was made with patients to assess their understanding of the information provided. The quality of drug labeling was assessed by calculating mean labeling score composed of seven dispensing attributes. Mean patient knowledge score was also attained by calculating scores composed of four attributes. Dispensing time was recorded for each patient using stop watch from the entrance to exit of the patient from the pharmacy.

4.4 Population

4.4.1 Source population

All patients with dispensed drugs coming out of Adulala Health Center Outpatient pharmacy in nine working days. Patients undergoing direct observed treatment (DOT's) of tuberculosis and patients on antiretroviral therapy (ART) were excluded from the

study. In addition patients under the age of 6 years and those having hearing loss are excluded.

4.4.2 Study population

All patients who got the prescribed drugs and all of their drugs were included during the study period.

4.5 Sampling technique

Convenient sampling technique was used, since the study attempted to cover all consecutive patients who attend the pharmacy to get the prescribed drugs over the study period.

4.6 Data collection

To avoid dispenser bias, the data collection interview with the patients by standing 5 meter away from pharmacy to be out of sight of the dispenser and whole data collection process was done in the middles of the working hours.

4.7 Study variable

Independent variables

1. Educational status of the patient
2. Age of the patient
3. Sex of the patient

Dependent variable

1. Knowledge of the patient about the dispensed drugs
    - Dose (quantity taken at a time)
    - Frequency of administration
    - Duration of therapy

- Reason for prescription

2. Labeling pattern of dispensed drugs which include
    - Name of the patient
    - Name of the drug
    - Strength of the drug
    - Dose of the drug
    - Frequency
    - Duration
    - Expiry date
3. Percentage of drugs actually dispensed
4. Average dispensed time

4.8 Quality assurance

The format /check list was checked for having all the necessary information and whether it was properly filled.

4.9 Data analysis and presentation

Data was analyzed using SPSS version 16.0 and presented using tables. A chi-square test was used to compare if there is association between the independent variables (age, sex and educational status) and dependent variables (knowledge on dose, duration of treatment, reason for prescription and frequency of use). A P value of 0 to 0.05 was used to compare the association of the variables in the statistical analysis used. When the P value is less than 0.05 there is association between the variables and when it is greater than 0.05 there is no association.

4.9.1 Calculation of scores

The quality of labeling had been measured and recorded by assigning a score (value) to each of the seven standard dispensing quality attributes name of the patient, name of the drug, strength of drug, dosage forms, frequency of administration, duration of treatment and expiry date.

Correct labeling had been given a score of 1 per attribute and a score of 0 had been given to incorrect or no labeling.

Patients' knowledge of dispensed drugs had been registered. Using the check list containing patient recall of the name of drug, dosage and frequency of administration, duration of treatment and reason for prescription had been scored as stated above.

4.9.2. Calculation of indicators

Percentage of drugs actually dispensed is calculated by dividing the number of drug actually dispensed to a total number of drugs prescribed then multiplied by 100 (one hundred).

Average number of drugs per encounter is calculated by dividing total number of different drug products to a total number of encounters surveyed.

Percentage of patients who adequately recall the dosage schedule is calculated by dividing number of patients who adequately report dosage schedule for all drugs to a total number of patients interviewed then multiplied by 100 (one hundred).

Percentage of patients who adequately recall the frequency of drug use is calculated by dividing number of patients who adequately report frequency for all drugs to a total number of patients interviewed then multiplied by 100 (one hundred).

Percentage of patients who adequately recall the duration of treatment is calculated by dividing number of patients who adequately report duration of treatment for all drugs to a total number of patients interviewed then multiplied by 100 (one hundred).

Percentage of patients who adequately recall the reason for use is calculated by dividing number of patients who adequately report dosage schedule for all drugs to a total number of patients interviewed then multiplied by 100 (one hundred).

Percentage of drugs adequately labeled is calculated dividing number of drugs containing at least patient name, drug name and when to take to a total number of drugs dispensed then multiplying by 100 (one hundred).

Average dispensing time is calculated by dividing the total time for dispensing time to a series of patients to a total number of encounters.

4.10. Ethical Consideration

The study was approved by the Ethics Committee of Adulala health center. The purpose of the study was explained to the study subjects and verbal consent was obtained before the interview. Any misunderstanding from the patient side was being corrected. The respondents were convinced to tell accurate information for the data included in the questionnaire. The patient's identity was maintained confidentiality throughout the study period.

4.11. Limitation of the study

- Respondents might respond ideally rather than what practically exercise.
- Respondents consisted only of patients who got drugs.

5. Result

5.1 Socio-demographic characteristics of the patients

A total of 302 patients from outpatient pharmacy were included in the study. Out of 302 patients, the majority, 189(62.6%) were females. Concerning the age of the respondents, majority of the respondents were in the age groups of 6-10 (28.8 %) years, 10-20 (21.5%) years and 21-45 years (38.1%). Regarding the educational status of the respondents most of them were illiterates (71.2%) out of which 45% were females.

Table 1:- Background information of patients served at Adulala health center outpatient pharmacy, East shoa, Oromiya region, Ethiopia, January 23 - February 7, 2014.

Background information		Number of patients served	Percentage (%)
Sex	Male	113	37.4
	Female	189	62.6
	Total	302	100
Age in year	6-10	87	28.8
	10-20	65	21.5
	21-45	115	38.1
	45-55	20	6.6
	>55	15	5
	Total	302	100
Educational status	Illiterate	215	71.2
	Primary school	65	20.5
	High school	13	4.3
	Diploma and above	12	4
	Total	302	100

5.2 Prescribed and dispensed drugs

For 302 patients 655 drugs were prescribed and 554 (84.58%) were actually dispensed. The average number of drugs per encounter was found to be 1.83. Majority (46.93%) of the dispensed drugs were chemotherapeutic.

Table 2: Class of drugs dispensed to patients at Adulala health center outpatient pharmacy East shoa, Oromiya region, Ethiopia, January 23 - February 7, 2014.

Class of drugs	Number of drugs dispensed	Percentage (%)
Chemotherapeutic	260	46.93
Analgesics	157	28.34
CNS	2	0.36
GIT	33	5.96
Minerals & vitamins	102	18.41
Total	554	100

5.3 Patient knowledge

All of the respondent recalled /correctly stated dose in 554 (100%), frequency in 438 (79.06%), duration of treatment 204 (36.82%) and reason for prescribing in 166 (29.96%). Patient knowledge score was calculated for each of the four attributes and the mean patient knowledge score was found to be 2.46 which is (61.46%) of the total score.

Table 3:- Patient knowledge on dispensed drugs at Adulala health center outpatient pharmacy, East shoa, Oromiya region, Ethiopia, January 23 - February 7, 2014.

Indicators	Drugs dispensed		Percentage (%)
Dose	Yes	554	100
	No	0	0
	Total	554	100
Frequency	Yes	438	79.06
	No	166	19.94
	Total	554	100
Duration	Yes	204	36.82
	No	350	63.18
	Total	554	100
Reason	Yes	166	29.96
	No	388	70.04
	Total	554	100

5.4 Labeling pattern of dispensed drugs

All of the dispensed drugs were labeled with their name, strength and expiry date 554 (100%) and only 26 (4.7%) of them were labeled with patient name. The mean labeling score in the health center was 4.41 and represents 63.00 % of the total scores. According to this study, the percentage of the drug adequately labeled was 4.69 %.

Table 4:- Labeling pattern of dispensed drugs at Adulala health center outpatient pharmacy, East shoa, Oromiya region, Ethiopia, January 23 - February 7, 2014.

Indicators	Drugs dispensed		Percentage (%)
Name of drug	Yes	554	100
	No	0	0
	Total	554	100
Patient name	Yes	26	4.7
	No	528	95.3
	Total	554	100
Strength of the drug	Yes	554	100
	No	0	0
	Total	554	100
Frequency of administration	Yes	187	33.75
	No	367	56.25
	Total	554	100
Dose labeled	Yes	410	74
	No	144	26
	Total	554	100
Duration of treatment	Yes	159	28.7
	No	395	71.3
	Total	554	100
Expiry date	Yes	554	100
	No	0	0
	Total	554	100

5.5 Class of medications dispensed in different patient age group

From 554 different drugs Analgesics, GIT, CNS and Mineral and Vitamins were the different class of drugs actually dispensed. From 266 chemotherapeutics 82, 59, 89, 16, 14 were dispensed in the age group of 6-10, 10-20, 21-45, 45-55 and >55 years old respectively. From 157 analgesics 51, 36, 45, 14, 11 were dispensed in age group of 6-10, 10-20, 21-45, 45-55 and >55 years old respectively. From GIT drugs 3, 7, 10, 6, 7 were dispensed in age group of 6-10, 10-20, 21-45, 45-55 and >55 years old respectively. From 102 mineral and vitamins 28, 21, 46, 4, 3 were dispensed in age group of 6-10, 10-20, 21-45, 45-55 and >55 years old respectively. And only two CNS drugs were dispensed in the age group of 21- 45.

Table 5: Number of different medication dispensed in each patient age group at Adulala health center outpatient pharmacy, East shoa, Oromiya region, Ethiopia, January 23 - February 7, 2014.

	Age					Total
Medication	6-10	10-20	21-45	45-55	>55	
Chemotherapeutic	82	59	89	16	14	260
Analgesics	51	36	45	14	11	157
GIT	3	7	10	6	7	33
CNS	0	0	2	0	0	2
Mineral and vitamins	28	21	46	4	3	102
Total	164	123	192	40	35	554

5.6 Patient knowledge on dispensed drugs and sex

All patient including females and males recalled the dose of drug dispensed to them. From 554 dispensed drugs frequency was recalled in 141 and 246 drugs, duration recalled in 84 and 120, reason for prescription recalled in 91 and 88 by males and females respectively. As chi-square calculation indicates there is no association between sex of

patients and their knowledge (dose, frequency and duration of treatment) on dispensed drugs.

Table 6: Patient knowledge on dispensed drugs and sex at Adulala health center outpatient pharmacy, East shoa, Oromiya region, Ethiopia, January 23 - February 7, 2014.

Knowledge		Sex			
		Male	Female	Total	P-value
Dose	Know	206	348	554	0.423
	Doesn't know	0	0	0	
	Total	206	348	554	
Frequency	Know	141	246	387	0.630
	Doesn't know	65	102	167	
	Total	206	348	554	
Duration	Know	84	120	204	0.115
	Doesn't know	122	228	350	
	Total	206	348	554	
Reason	Know	91	88	179	0.000
	Doesn't know	115	260	375	
	Total	206	348	554	

5.7 Patient knowledge on dispensed drugs and their age group

All patients recalled dose of all of drugs dispensed to them. From 554 dispensed drugs frequency was recalled in 107, 91, 141, 27 and 23 drugs, duration recalled in 44, 45, 80, 17 and 12, reason for prescription recalled in50, 27, 62, 13 and 15 in the age group of 6-10, 10-20, 21-45, 45-55 and >55 years old respectively. As chi-square calculation indicates there is significant association between age of patients and their knowledge on dispensed drugs.

Table 7: Patient knowledge on dispensed drugs and their age group at Adulala health center outpatient pharmacy, East shoa, Oromiya region, Ethiopia, January 23 - February 7, 2014.

Knowledge on dispensed drug		Age group						P-value
		6-10	10-20	21-45	45-55	>55	Total	
Dose	Know	156	124	199	49	26	554	0.000
	Doesn't know	0	0	0	0	0	0	
	Total	156	124	199	49	26	554	
Frequency	Know	107	91	141	27	23	389	0.034
	Doesn't know	49	35	58	22	8	165	
	Total	156	126	199	46	31	554	
Duration	Know	44	45	80	17	12	198	0.000
	Doesn't know	112	79	109	32	16	356	
	Total	156	124	199	49	26	554	
Reason	Know	50	27	62	13	15	167	0.000
	Doesn't know	106	97	137	36	13	387	
	Total	156	124	199	49	28	554	

5.8 Patient knowledge on dispensed drug and their educational status

All patients in all educational status recalled the dose each drug. From 554 dispensed drugs frequency was recalled in 19, 28, 232 and 110 drugs, duration recalled in 17, 7, 134 and 47, reason for prescription recalled in 16, 4, 123 and 41 by Diploma and above, High school, Illiterate and primary school respectively. As chi-square calculation indicates there is significant association between educational status of patients and knowledge on their dispensed drugs.

Table 8: Patient knowledge on dispensed drug and their educational status at Adulala health center outpatient pharmacy, East shoa, Oromiya region, Ethiopia, January 23 - February 7, 2014.

Knowledge on dispensed drugs		Educational status					p-value
		Diploma and above	High school	Illiterate	Primary school	Total	
Dose	Know	20	31	374	129	554	0.000
	Doesn't know	0	0	0	0	0	
	Total	20	31	374	129	554	
Frequency	Know	19	28	232	110	390	0.000
	Doesn't know	1	3	142	19	184	
	Total	20	31	374	129	554	
Duration	Know	17	7	134	47	207	0.000
	Doesn't know	3	24	240	82	350	
	Total	20	31	374	129	554	
Reason	Know	16	4	123	41	184	0.000
	Doesn't know	4	27	251	88	370	
	Total	20	31	374	129	554	

5.9 Dispensing time

The average dispensing time at Adulala outpatient pharmacy was found to be 152 second. The minimum and maximum dispensing time were 25 seconds and 420 seconds respectively.

Table 9: Dispensing time at Adulala health center outpatient pharmacy, East shoa, Oromiya region, Ethiopia, January 23 - February 7, 2014.

	Dispensing time (seconds)	Number of patients
	25	1
	30	4
	32	1
	42	1
	45	1
	50	1
	56	1
	57	1
	60	13
	70	13
	80	11
	90	40
	102	1
	110	2
	117	3
	118	3
	120	43
	130	10
	133	4
	134	1
	140	16
	144	4
	150	33
	170	2
	180	20
	190	13

	193	2
	195	5
	198	2
	200	5
	201	3
	210	4
	220	1
	230	2
	240	3
	246	5
	250	1
	260	4
	270	6
	300	4
	310	1
	316	2
	330	2
	340	1
	381	2
	390	2
	410	1
	420	1
Total	45904	302

6. Discussion

Lack of knowledge and information by the patient about the dispensed drug (the drug they take) leads to incorrect use which in turn results in loss of efficacy or occurrence of adverse effect [3]. The quality of labeling applied by dispensers, the time spent informing the patients, and the communication skill of the dispensers can therefore affect compliance rates [1].

A total of 302 patients from outpatient pharmacy were included in the study. Out of 302 patients or caregivers, the majority, 189(62.6%) were females. Concerning the age of the respondents, majority of the respondents were in the age groups of 6-10 (28.8 %) years, 10-20 (21.5%) years and 21-45 years (38.1%). Regarding the educational status of the respondents most of them were illiterates (71.2%).

For 302 patients 655 drugs were prescribed and 554 (84.58%) were actually dispensed which lower than the study done at Niger (100%), North West Ethiopia (89%),and a study done by Mulugeta *et al*. at Yebu Health center (89.04%), Serbo Health Center (89.55%), whereas greater than the study done by Mulugeta *et al*. at Shebe health center (77.74%) and Jimma health center (77.77%), India (54.7%), South East Asia (43%) [9, 10, 13, 15]. The average number of drugs per encounter was found to be 1.83 which is even less than the national value (1.99) and also at Shebe health center (2.88) by Mulugeta *et al*. [13, 17]. This indicates that there is no poly pharmacy problem and it could also be the reason for good patient knowledge on dispensed drug though dispensing time was short.

The function of the label on dispensed drugs is to uniquely identify the content of container and to ensure that patient have clear and concise information about the use of drug. Thus, specific instruction should be placed on the package of the drug in language the patient can understand. In this study all the dispensed drugs were labeled with their name, strength and expiry date even though it was not labeled by the pharmacist but which already was on the original package of the drug and also it was not in the language

all patients can understand. In addition It was observed that the majority of dispensed drugs were dispensed in their original packages and the rest were dispensed by envelops and containers already prepared such as plastic containers.

All of the dispensed drugs were labeled with their name, strength and expiry date 554 (100%).This value is greater than the study in Botswana which is 50% [1]. The reason for this greater percentage was considered to be due to the fact that most of the drugs such as a blister of tablets, drugs in ampoules and bottle were dispensed in their original package which has already labeled with their strength, name and expiry date even though it was not labeled by the pharmacist but which already was on the original package of the drug and it was labeled in English language which could not be understood by all patients. Only 26 (4.7%) of them were labeled with patient name and if the name of patient was not indicated on the label medication error may occur since the drug may be used unknowingly by incorrect patient (family members, friends, neighbors, etc.). The percentage of drug adequatly labeled was 26 (4.7%) of the dispensed drugs which is lower than the study done by Mulugeta *et al*. at Shebe Health Center(71.4%), Yebu Health Center(73.33%), Serbo Health Center(67.27%), Jimma Health Center(68.33%) and Ghana (100%) [13, 14, 15] whereas this value is greater than study done at Alexandria (0%) [16]. Regarding the labeling score of dispensed drugs, the majority of the dispensed drug have a labeling score of 4 on 410 (74%) and 5 on 187(33.76%) of the total dispensed drugs. The mean labeling score in the health center was 4.41 out of 7 and represents 63.00 % of the total scores.

Knowing dose is one of the selected patient knowledge indicators. All patients correctly recalled dose of drug this value higher than study done at Bangladesh (44%) [4]. Only 29.92% of the patients recalled reason for prescription of drugs encountered. This value is less than the value obtained in study done at Botswana (92%) [1]. This is could be due to illiteracy and low level of educational status of the participants. The frequency of administration was recalled in over 79.06% of the dispensed drugs which is higher than research done at Addis Ababa (60%) and Ghana (54%) [12,14]. The duration of the treatment was recalled in nearly 36.82% of the dispensed drugs is lower than the study done at Botswana (44%) and higher than that of Ghana (6%) [1,14]. This value is very

low and most of the prescribed drugs were chemotherapeutic (49.93%) out of which most were antibiotics so poor knowledge on duration of treatment may result in antibiotic resistance and should be improved.

Patient knowledge score was calculated for each of the four attributes and the mean patient knowledge score was found to be 2.46 out of 4 attributes which is (61.46%) of the total score. This value is lower than patient knowledge score found in primary health care of Botswana (2.5%) per four attributes presenting 63% of the total scores [1]. In this study educational level of respondents determined patient knowledge. This was confirmed by the result that educational level of the patient is strong predictor of knowledge score of dispensed drugs (p-value =0.000). In addition to educational status, age has also strong association on patient knowledge of dispensed drug (p-value<0.05). Whereas sex has no association with patient knowledge on dose, frequency and duration (p-value=0.423, 0.630, 0.115) respectively.

The total mean dispensing time obtained in this study was 152 second which is lower than the study done at Niger (204 second) [10]. But this value is greater than other studies done in Yugoslavian (20.5 to 48.2 seconds), Jordan (28.8 +/- 23.7 seconds), Tanzania (average of 84seconds), Southwest Ethiopia (73.8 to 75 seconds) and India (131.4 seconds) [6, 7, 9, 13, and 15]. This outcome has an effect on patient satisfaction and enablement since dispensing time also includes dispensing counseling time at which time the pharmacist counsel the patient. It is regarded to be short to allow optimal information to be given on medications and for answering the questions from patients. This value is still not enough to achieve high mean patient knowledge score.

7. Conclusion

The study showed that dispensed medications had poor labeling. Adequate patient knowledge score was not found. Educational level and patient age have strong association with patient knowledge on dispensed drug whereas sex has no association with patient knowledge. Dispensing time was short when compared to WHO guidelines. Not all prescribed medications are dispensed.

8. Recommendation

Dispenser should have special concern to elderly and low level educational status patients. The facilities should also provide dispensers at pharmacy with marker for easy labeling in order to improve patient knowledge on their dispensed drug. Values for percentages of drugs actually dispensed are less, labeling of drugs and patient knowledge of the drug dispensed should be as high as possible. Furthermore, interventional study aimed at improving the quality of dispensing should be carried out using both labeling and knowledge scores. The dispensing time needs to be improved in order to allow patient ask questions what is not clear about their medication for improving rational drug use.

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Annex I: Questionnaire

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Questionnaire for assessment of labeling and patient knowledge of dispensed drugs in Adulala health center outpatient pharmacy

1. Name of Pharmacy_____

2. Dispenser in the Pharmacy_____, _____, _____

3. Background information of a patient

3.1. Sex:

Male ☐ Female ☐

3.2. Age: _____ [year]

3.3. Educational status:

a. Illiterate ☐ c. High school ☐

b. Primary school ☐ d. Diploma and above ☐

4. Class of drugs dispensed to patients

a CVS ☐ b. Chemotherapeutic ☐ c. Analgesics ☐

d. Anti-diabetic ☐ e. Ant thyroids ☐ f. GIT ☐ g. CNS ☐

h. Minerals and vitamins ☐ i. other _____

5. Have you get any information about your medication? Yes ☐ No ☐

6. Patient knowledge on the dispensed drug

S. No.	Dose of the drug		Frequency of administration		Duration of treatment		Reason for prescription	
	Yes	No	Yes	No	Yes	No	Yes	No
1								
2								
3								
4								
5								
6								

7. Labeling on the dispensed drugs (to use observed directly from the dispensed drug (s))

S. No.	Name of dispensed drugs		Patient name		Strength of the drug		Dose of the drug		Frequency of administration		Duration of treatment		Name of the drug		Expiry Date	
	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
1																
2																
3																
4																
5																
6																

8. Number of drugs actually dispensed to this patient _____ out of _____ prescribed drugs.

9. Dispensing time _____