ASSESSMENT OF DISPENSING PRACTICE AND QUALITY OF PHARMACEUTICAL SERVICE AT HARAR GENERAL HOSPITAL EASTERN ETHIOPIA

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Abstract

Introduction
The dispensing practice effectiveness was affected by the way the drugs were dispensed and the types of information delivered to the patients during dispensing. Therefore, assessing dispensing practice and quality of pharmaceutical services helps us to identify the main factors encountered during dispensing practice and helps to contribute knowledge for pharmacists to identify major causes for dispensing errors.

Objectives
The aim of this study was to assess the dispensing practice and quality of pharmaceutical service at Harar general hospital in Harar town eastern Ethiopia. From April 11 to 30, 2019..

Methods
A cross-sectional study was conducted in Harar General hospital .of Harar town, located 516 km east of Addis Ababa. All (pharmacists and druggists) dispensers who were worked at Harar General Hospital and randomly selected patients included in the study. The data were collected using pretested structured questionnaires and an observational checklist . SPSS Version 21 for windows was used for data processing.

Results
The majority of respondents-LRB- 81% of respondent got drugs from the pharmacy more than two drugs while the remaining 19% of respondent get only one drug from the pharmacy. Among the respondents , 76.5% get all drugs that prescribed by the prescriber and 23.5% of respondent do not get all drugs that prescribed medication. Ninety- eight percent of respondents were given instructions on how to take their medicine. Only 2% were not given any instructions. The majority of respondents spend time with a dispenser in the pharmacy between one up to three minutes 51percent , between thirty seconds up to one minute

25percent, three up to five minutes 21 percent, under thirty seconds 6 % , and 3 % of respondents spend time more than five minutes with a dispenser. A pharmacist issued out the medicine in 41 percent of patients encounters, pharmacy technologists , 19 percent of the encounters. Out of the observations made, the dispenser confirmed 42.7 % of the names of patients, and 45.4 % of patients were shown the drugs that were being dispensed to them during counseling.

Conclusion

The average dispensing time was shorter than the WHO standards. The majority of the patients interviewed were usually not told about the names of their medications. The percentage of drug availability was over 76.5 %, but low compared to the WHO standard. Patients had good knowledge of how to take their medication, although information on labels was inadequate.

Keywords: Druggist , Dispensing , and Pharmacist

1.Introduction

The process of preparing drugs and distributing them to their users with the provision of appropriate information is referred to as dispensing [1].It may be based on a prescription or an oral request of users (patients or care providers) depending on the type of drug to be dispensed. The process of dispensing involves the exact interpretation and validation of the prescription or oral request, exact preparation and labeling of drugs , and delivery of appropriate information. Dispensing of the drug should be dispensed in a safe and in a hygienic manner, be confident that the patient or care provider understands and appreciates the value of taking specific indications for a specific drug [2]. Dispensing practice has a pivotal role in the provision of rational drug therapy. It starts with the interpretation of prescriptions followed by preparation and labeling of medications , advice and counseling , handing over of medicine to patients for use as per directions , and concludes when appropriate records are made. Good dispensing practice ensures that the correct drug is delivered to the right patient in the required dosage and quantities with clear instructions and a package that maintains the integrity of drugs[1, 3] .

However, efforts have been concentrated on ensuring rational prescription , and the quality of dispensing has been overlooked[4, 5] . Several reports from both developed and developing countries indicate that incorrect dispensing, self-medication , and use of sub- therapeutic doses are major causes of irrational drug use [6]. Since pharmacists provide drug information during dispensing, they have a substantial role in avoiding medication misuse and latent error. Furthermore, the quality of counseling offered can improve treatment safety and patient compliance , as it can improve patients understanding of the use and side effects associated with medications prescribed[2, 7].

According to the World Health Organization (WHO), more than 50% of all medicines are not correctly prescribed and dispensed , and more than 50% of patients take their drugs incorrectly. This situation is far worse in developing countries. Irrational drug use leads to reduction in the quality of drug therapy, wastage of resources , increased treatment costs , increased risk of adverse drug reactions , and emergence of drug resistance[4].

According to Hong Kong medical association , there are lots of factors contributing to dispensing errors. These are in adequate knowledge or skills, fail to comply with policies or procedures, failure in communication or misinterpretation of prescription order, stress, similar drug name, stock management, wrong

dose mislabeling, illegible hand writing, unclear prescription, product labeling and drug storage problem [8]. The lack of necessary materials or medicines in hospitals and the low purchasing power of the population have sometimes led to the use of available and affordable medications that are not necessary represent the most appropriate treatment. Extremely low and irregularly paid salaries have lowered the motivation of health professionals and worsened the quality of care. Availability of new medicines at the market and poor access to information their knowledge [9].

Irrational dispensing practices like any other developing country are not uncommon in Ethiopia. The dispensing of prescription only drugs at partial doses and even without prescription, poor labeling of the dispensed items, lack of patient counseling , incomplete compiling and recording of prescriptions, and charging patients unreasonably high prices are among the irrational dispensing practices [2]. In Appropriate labeling of stock containers is liable to unsafe selection of the correct preparation and increase the risk of error in selecting a stock container during the dispensing process according to colors or location of the container, without consciously reading the label , has dangerous consequences for the patients.

In Ethiopia, poor understanding of medications leading to non-adherence is a common phenomenon indicated by different studies [10].This might have been attributed to poor dispensing practices. However , even though there are studies conducted in Ethiopia assessing rational drug use practice [11, 12]. A comprehensive study assessing dispensing practice is lacking , particularly in Harar General Hospital. Therefore, the objective of this study

was to assess the quality of dispensing in outpatient pharmacies.

The aim of the study was to ensure the availability of facilities including equipment's and materials in the dispensary room, the drug information updating sources for pharmacists , and to identify the main problems encountered during dispensing practices. Moreover, the current study evaluated the quality of pharmaceutical services provided.

There for, this study aims to assess the dispensing practice and quality of pharmaceutical services at Harar General Hospital.

2. Methods and Materials

2.1. Study Area and Period.

The study was conducted at Harar General Hospital, geographically located in Harari region, Harar town , located in eastern part of Ethiopia 526 km away from Addis Ababa. The data were collected from April 11 to 30,2019.

2.2. Study design and data collection.

The study was institution-based , a cross-sectional participatory observation of drug dispensing processes , and interviews with patients using a structured questionnaire and assessment of the dispenser process using a checklist . Data were collected from April 11 to 30,2019.

2.3. Source Population.

All patients visited the hospital pharmacy for health services and Druggist and Pharmacists working at Harar General Hospital.

2.4. Study Population.

Randomly selected clients visiting the hospital pharmacy during the study period and all dispensers in Harar General Hospital were the study population.

2.5. Inclusion and exclusion criteria.

Randomly selected including patients visiting the hospital pharmacy who came to Harar General Hospital were included in the study and clients who needed to get medicines prescribed out of the hospital. However , patients who registered with missing treatment outcomes were missing and patients were transferred to other districts were excluded from the study.

2.6. Sample size determination.

Since the study population was small that was total pharmacists and druggist the study area population was 122,664 , the average number of patients was 302who were included in the study exclusively. 2 pharmacists and 1 druggist dispenser who were available at Harar General Hospitals was included in the interview.

The sample size was calculated using the formula for estimating the single population proportion.

$$n = \frac{(Z\alpha/2)^2 P (1- P)}{d^2}$$

where **n** = the desired sample size

P = the proportion is taken from similar studies in the Jimma assumption of 50%[10]

d = Margin of error 5% = (0.05)

Non-response rate of 10% = (0.1)

Zα/2 = Critical value at 95% confidence level of certainty (1.96) (alpha 0.05).

Based on the above assumptions, the total desired sample size was **384 patients.** Since the source population 2693 is less than 10,000 , some adjustment was made by the correction formula (n/ (1+ (n/N)) and 10% was added for the non-response rate. The maximum sample size was 302**.**

2.7. Sampling Technique

A simple random sampling technique was used to select 302 existing clients from the hospital.

2.8. Data Collection Procedure

Data were collected by interviewing the patients through structured questionnaires and an observational checklist from a druggist and pharmacist.

2.9. Data processing and analysis

Data were entered and cleaned in to computer software using the Statistical Package for Social Science (SPSS) version 20.0.Frequency was used for the test statistical significance of the observed

association in some cross tabulations to describe frequencies of variables.

2.10. Ethical consideration:

An official letter of cooperation was written to the hospitals from the Harar Health Science College. Informed verbal consent was obtained from respondents before answering the question. The participants were informed that the information collected was anonymous and could be withdrawn from participation if they were unhappy during answering the question.

2.11. Operational Definition

• **Good dispensing practice**: refers to the delivery of the correct drug and medical supply to the right patient, in the required dosage and quantities, in the package that maintains acceptable potency and quality for the specified period, and clear drug information(7).

• **Dispensing Error**: Error occurred during dispensing in the pharmacy setting, such as not checking patient age, not dispensing correct drug, correct frequency, and correct total quantity.

• **Average dispensing time**: The purpose is to measure the time that pharmacists or pharmacy technicians spend with the patients during dispensing drugs in the pharmacy. Paying and waiting time is not included.

• **Drug**: means any substance or mixture of substances used in the diagnosis, treatment, mitigation , or prevention of a disease in humans or animals.

• **Dispensing:** means to prepare drugs and/or medical supplies and distribute them to their users.

• **Dispenser**: means any person who is licensed or authorized to dispense drugs and/or medical supplies.

• **Prescription drugs**: means drugs that are dispensed with prescription only.

• **Over-the-counter drugs**: means drugs that are dispensed even without prescription.

• **Pharmaceutical services**: providing medications and other healthcare products and services

• **OTC;** over the counter drugs; sold directly to a consumer without a prescription

3.Results

3.1. Socio demographic characteristics of respondents

The background information of the customers seeking services from Harar

General Hospital is summarized in Table 1. A total of 302 clients were enrolled in the study , of which 54.6% of the customer respondents seeking health services from the hospital were male. The highest proportion 34.4% RRB were in the age group of 18 - 24 year age group. Among the respondents , 39.4% were married , while about 46% were single. During the present survey, out of the total respondents, 41.1% were diploma and above , and the highest number of occupational status of the respondents were government employees (37.2%), the majority (65.2%) of respondents had come from urban, and 53% of the respondents came to the hospital because of illness , and 85% of the respondents were paid for the service rendered (Table-1).

Table -1: Socio-Demographic Characteristics of Health Service Received at Harar General Hospital Pharmacy in Harar, April 11 to 30/2019 (n=302)

3.2. Taking information from responders

The majority of respondents (81%) of respondent got drugs from the pharmacy more than two drugs while the remaining 19% of respondent get only one drug from the pharmacy. Among the respondents (76.5%) get all drugs that prescribed by the prescriber and 23.5% of respondent do not get all drugs that prescribed medication. 98 percent of respondents were given instructions on how to take their medicine. Only 2% were not given any instructions. The amount of time the pharmacy staff offered to spent with the respondents was adequate for how to take medication for them to understand well (82%) , while 18% of respondents were not adequate for how to take medication to understand and respondents were impressed by their handling by the pharmacy staff (65%) , and respondents who indicated that they had asked questions for clarifications (16.6%). Majorly (83%) of respondents did not ask questions for clarifications and among respondents who asked questions and were satisfied with the answers (19.5%) and not (80.5%) (Table 2).

Among the respondents (31.5%) able to mention the name of drugs taken from pharmacy staff , but the majority of respondents (68.5%) didnot mention the name of drugs taken from the pharmacy. Among the respondents (24.5%) provided information from the dispenser about the side effect of medication. also (23.5%) of respondents able to mention the side effects of medication. The majority (86.4%) of

respondents did not provide information about drug contradictions from the pharmacy staff, while (13.6%) of respondents were provided. Among the respondents (12.6%) able to mention the contradiction of the medication and (91.7%) of respondents do not able to mention at all. The minority of respondents (6%) provided information about drug- -drug interaction , and the majority (94%) of respondents did not provide information about drug- -drug interactions at all(fig 1). The majority of respondents spend time with a dispenser in the pharmacy between one up to three minutes 51%, between thirty seconds up to one minute 25%, three up to five minutes 21 percent , under thirty second 6 % , and 3% of respondents spend time more than five minutes with dispensers(fig 2).

3.3 Observation of pharmacy Staff involvement in the dispensing process

A pharmacist issued out the medicine in 41% of patients encounters , pharmacy technologists, and 19% of the encounters (Table 3).

Out of the observations made, pharmacists were available 86% of the patients encounters and absent 14% of the time. Eighty- three percent of the drugs dispensed were cross- checked by a supervising pharmacist, while 20% were dispensed without being checked. During the time of the study, pharmacists were always involved in the dispensing process 47.7% of the time. During 39.7% of the time, pharmacists were available , but not always. Pharmacists were not available only 12.6% of the time(Table 4).

3.4 Assessment of medicine related information provided

Out of the observations made, the dispenser confirmed 42.7% of the names of patients, but did not confirm 57.3%. 45.4 % of patients were shown the Drugs that were being dispensed to them during counseling (Table 5).

95 percent of patients were informed about the frequency of dosing of drugs dispensed. 6 percent of the patients did not have any idea about the frequency of dosing of drugs dispensed to them. Ninety- four percent of patients were told how long they were supposed to take their medication and 6 % didnot know for how long they were supposed to continue with their medication25% of patients had the names of their drugs mentioned to them during the dispensing process. The names of 74.5% were not mentioned at all.

28 percent of respondents were given the purpose of drug to take their medicine. Only

2% were not given any reason.Out of the observations made (Fig 3),

3.5 Written prescriptions and actions taken

When asked about the action they took when prescriptions were not illegible, 100% of them stated that the prescriptions were taken back to the prescriber for clarity. No one stated that they tried to figure it out among themselves. When asked the action they took when prescribed drugs were not available, 33% of written prescriptions for patients to buy from community pharmacy and 67% of informed to prescriber to write what is available(Table 6).

3.6 Association between who finally issues out medicines to patients and patients' knowledge of the name of medicine

Among the patients who were told the name of medicine, 28 % were issued out medicines by pharmacists compared to 21% of patients who were issued out medicines by pharmacy technicians. Also, among the patients whose medicines were dispensed by pharmacists , 35.5 % knew the name of the medicines. Again , among patients whose medicines were dispensed by pharmacy technicians, 24 % knew the name of their medicines(Table 7).

3.7 Association between who finally issued out medicine to patients and patients' knowledge of side effects of medicine

Among the patients who were told about the side effects of medicines , 30 % were finally issued out medicines by pharmacists compared to 14 % who were attended to by pharmacy technicians dispensed their medicines. Also, among the patients whose medicines were dispensed by pharmacists, 28.4 % knew the side effects of the medicines. Again , among patients whose medicines were dispensed by pharmacy technologists, 14 % knew the side effects. The professional background of the dispenser was significantly relevant to the patient knowledge of side effects of medicine. P=0.044(Table 8).

4. DISCUSSION

4.1 Socio-Demographic Characteristics of Respondents

The results of this study show that patients above sixty (60) years visited the HARAR GENERAL Hospital, most frequently compared to those between the ages of 15 and 20 years. This observation might be due to the fact that patients above sixty years are more prone to chronic diseases such as

hypertension, diabetes , and arthritis. They therefore visit the hospital more often for treatment, reviews , and refills.

4.2 Patient Knowledge of the Name of Medicine

In this study, dispensers mentioned the name of drugs dispensed to only a few patients. Over 74.5% were not told the names of their medications. According to the Ghana Health Service Patient's Charter, patients have the right to know the type of treatment they receive as well as potential risks involved. (Patients' Charter 2002). In situations where patients react to peculiar drugs, but cannot identify them, mentioning the names of the drugs would enable them to prompt dispensers and prescribers. This will go a long way to prevent adverse drug reactions.

In a study done to assess patients' knowledge of prescribed medicines at public facilities in several countries, the percentage of patients who knew the name of their medicine was 65% for Ghana, 61% for Tanzania, and 9% for India[13]. In this study, 31.5% observed appears to be low. Dispensers were so much in a hurry that mentioning the names of the drugs did not seem too important to them.

4.3 Instructions Given for Medicine Use

Instructions for medicine use and additional information on their medicines were given to almost all patients. Also, almost all patients interviewed were able to vividly recall the drug information and advice given during dispensing. This may be probably due to the fact that patients paid much attention during the counseling process. Ninety- nine percent of the patients knew the correct dosage of their medicines. In another study, 55%, 75%, 82% , and 81% were obtained for Zimbabwe, Nigeria, Bangladesh , and Nepal , respectively[14]. The overall patients' knowledge of correct dosage was high compared to the study mentioned above, probably due to an increase in public awareness of the importance of being involved in and responsible for one's own health and the importance of drug compliance. Also, the fact that some patients were coming for refill and were conversant with the way the medications were supposed to be taken might be another reason. To ensure that patients understand the instructions and medicine information given, it is best for patients to be asked to repeat instructions during the dispensing process.

4.4 Pharmacist availability and involvement

The dispensing process was observed without knowledge of the dispensing staff. On observation, it was shown that 86% of pharmacists were available at the pharmacy almost all of the time of the study and crossed checked almost all drugs to be dispensed. It is recommended by the WHO that drugs are finally checked, just before they are given out to patients. [13]. During this final check, the prescription should be read and well interpreted before checking the drugs. It is important that the appropriate prescribed dose is, drug interactions, identity of drugs dispensed as well and labels are also checked[13]. This final check would be best done by a pharmacist because of its detailed nature. At the Suntreso Government Hospital, the pharmacist at the adult counter and the other at the ante-natal counter cross-check drugs to be dispensed. However, since the pediatric counter had no pharmacist, it was the pharmacy assistant who dispensed medicines at that counter.

4.5 Average Dispensing Time

The average dispensing time was 2 minute, in this study. The WHO recommends an average dispensing time of 3 minutes[13]. In another study , the average dispensing times for Bangladesh, Nepal , and Tanzania were given as 23, 86 , and 78 seconds ,

respectively ,[14]. Sixty- one Second (61s) is shorter than WHO standards. This might be due to the fact that a large number of patients visited the pharmacy after assessing the hypertension and diabetes clinic as well as dental and Ante Natal Clinics. Patients who attended the /diabetic clinic came in as early as four o'clock in the morning and by the time they got to the pharmacy they were exhausted, hungry, and impatient. They therefore pressurize the dispensers to speed up the process, which has the risk of compromising on effective counseling and labeling.

A significant amount of time was also spent on manual drug entries, inspection of National Health Insurance cards, and filling of insurance claim forms, instead of the dispensing time itself. This could be explained by the fact that pharmacies that are overburdened, deliver in a more commercial way, decreasing the time a pharmacist spends with each customer and exerting less control over prescriptions[15]. Dispensing staff may rush through the dispensing process resulting in a lot of omissions, inadequate labeling, miscalculations, no or inadequate information, and counseling. The dispensing staff spend a short time (dispensing time) with the patient in an attempt to speed up the

process and clear the huge number of patients at the pharmacy. In dispensing, the accuracy of the process is more important than the speed at which one works [13]. Dispensers also assume that patients who come for refill their medications are aware of instructions and other drug information, since they have been on them for some time.

5. Conclusion and Recommendations

The average dispensing time was shorter than the WHO standards. The majority of the patients interviewed were usually not told about the names of their medications. The percentage of drug availability was over 76.5 %, but low compared to the WHO standard. Patients had good knowledge of how to take their medication, although information on labels was inadequate. This study has shown that if pharmacists are more involved in the dispensing process, patients are more likely to know their medicines, side effects , and likely to use them effectively for optimal outcomes. Based on the findings of this study, we recommend that patients should be properly informed about drugs not available at the hospital pharmacy and emphasize should be made that these drugs are equally important and must be obtained from a community pharmacy. As well Druggist and pharmacist adequate time should be taken to give patients proper counseling about their medication. This will increase the average dispensing time, enhance compliance , and improve drug therapy.

Table 1.

Table 1.			
Characteristics	**Group**	**Frequency**	**Percentage%**
Sex	a) Male	165	54.6%
	b) Female	137	45.4%
Age (in years)	a) 15-24	104	34.4%
	b) 25-35	85	28.1%
	c) 36-45	69	22.8%
	d) 45+	44	14.6%
Educational status	a) Illiterate	68	22.5%
	b) 1-6	41	13.6%
	c) 7-12	69	22.8%
	d) Diploma & +	124	41.1%
Occupational status	a) Farmer	80	26.5%
	b) Merchant	48	15.9%
	c) Gov't employ	114	37.2%
	d) No occupation	43	14.2%
	e) Student	17	5.6%
Religion	a) Muslim	105	34.8%
	b) Cristian	197	65.2%

Table 2. Taking information from responder from Apr 11-30/2019

Taking information from patient

		N	%
How many drugs did the pharmacy staff give you	ONE drugs	58	19%
	Two and more than two drugs	244	81%
Did you get all drugs that prescribed?	Yes	231	76.5%
	No	71	23.5%
Did pharmacy staff give you instructions about how to take your medication?	Yes	298	98.7%
	No	4	1.3%
Pleased with the amount of time the pharmacy staff spent with the patient.	Yes	248	82%
	No	54	18%
Patients asked the pharmacy staff questions for clarifications.	Yes	50	16.6%
	No	252	83.4%
If Yes, Those who were satisfied / not satisfied with the pharmacy staff answers.	Yes	59	19.5%
	No	243	80.5%
Impressed by the handling of patients by the pharmacy staff.			

Table 4. Taking information from dispenser in Harar General Hospital from Apr 11-30/2019

TAKING INFORMATION FROM DISPENSER	N	(%)
IS THE PHARMACIST AVAILABLE AT THE PHARMACY EVERY DAY? **YES**	259	86(%)
NO	43	14(%)
Are drugs cross checked by pharmacists before dispensing? **YES**	252	83(%)
NO	50	17(%)
PHARMACISTS' INVOLVEMENT IN THE DISPENSING PROCESS **YES**	144	47.7(%)
YES, BUT NOT ALWAYS	120	39.7(%)
NO	38	12.6(%)

n=number of patient encounters

Respondents taking information from dispenser

Fig 2

Responedent spend time with dispenser

- under 30 sec
- between 30 sec-1min
- between 1-3min
- 3min to 5 min
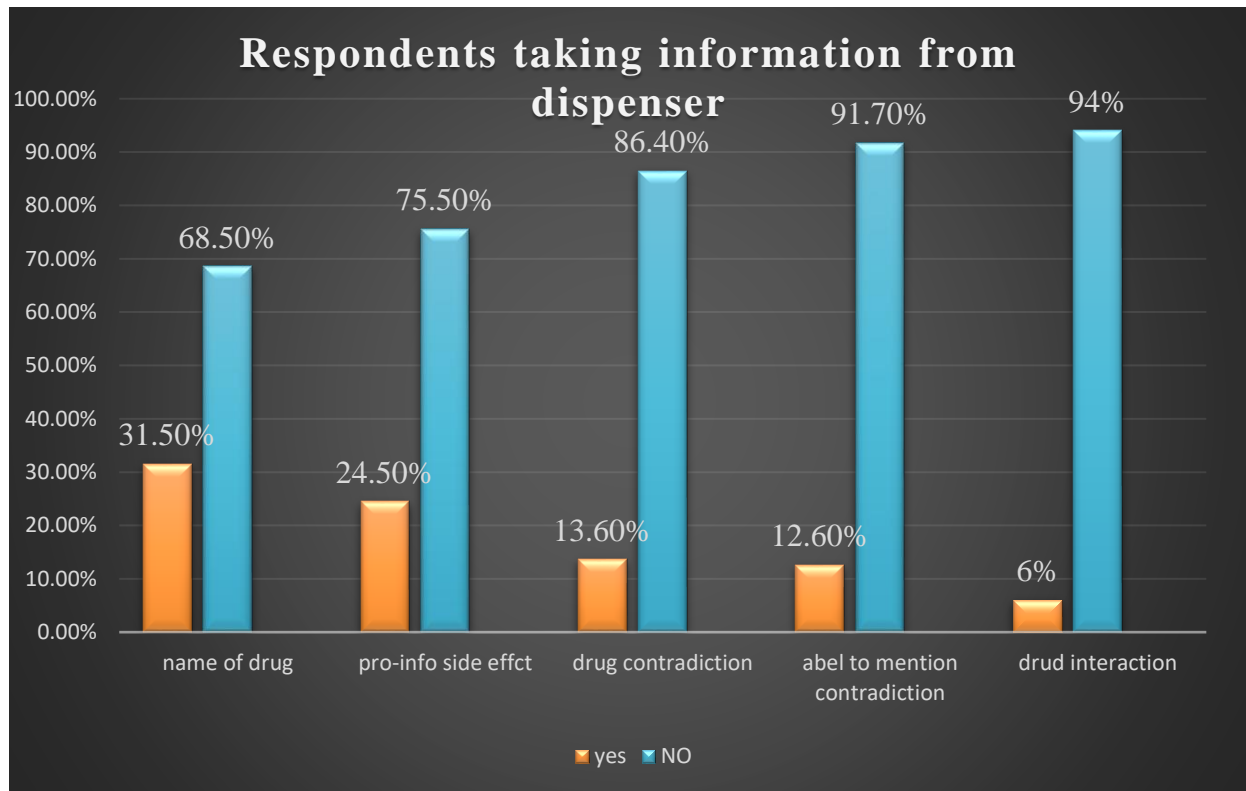- more than 5 min

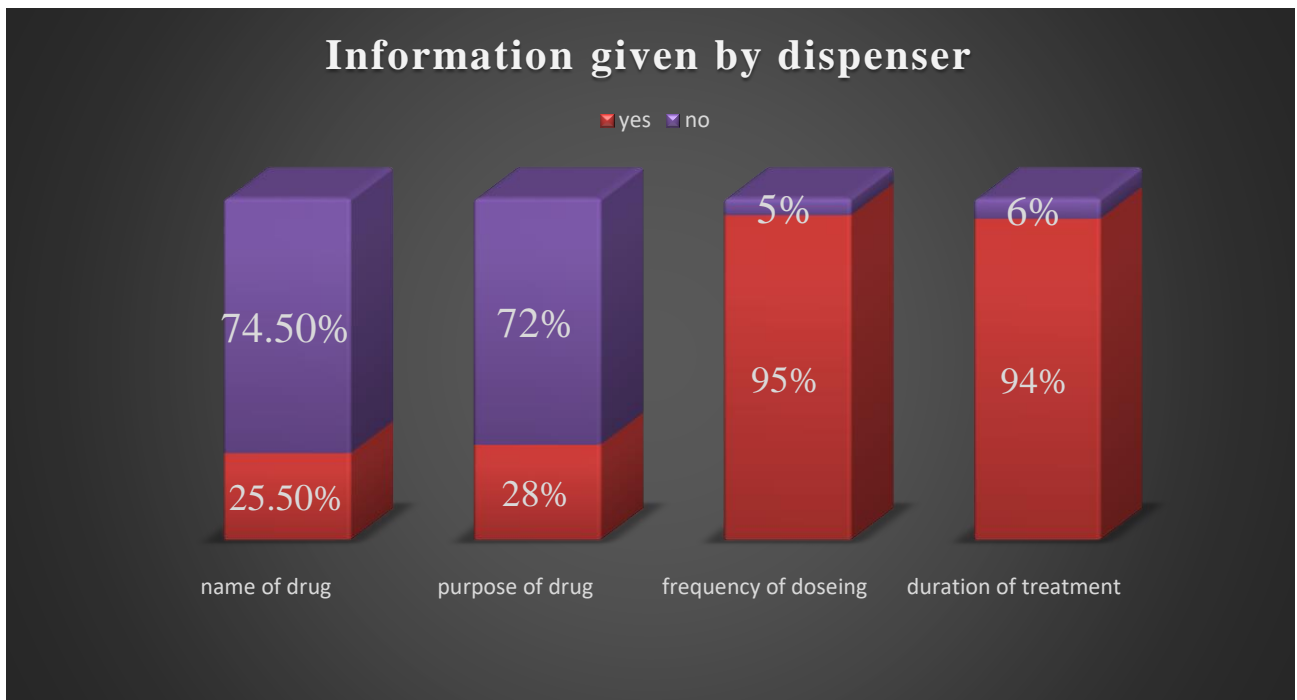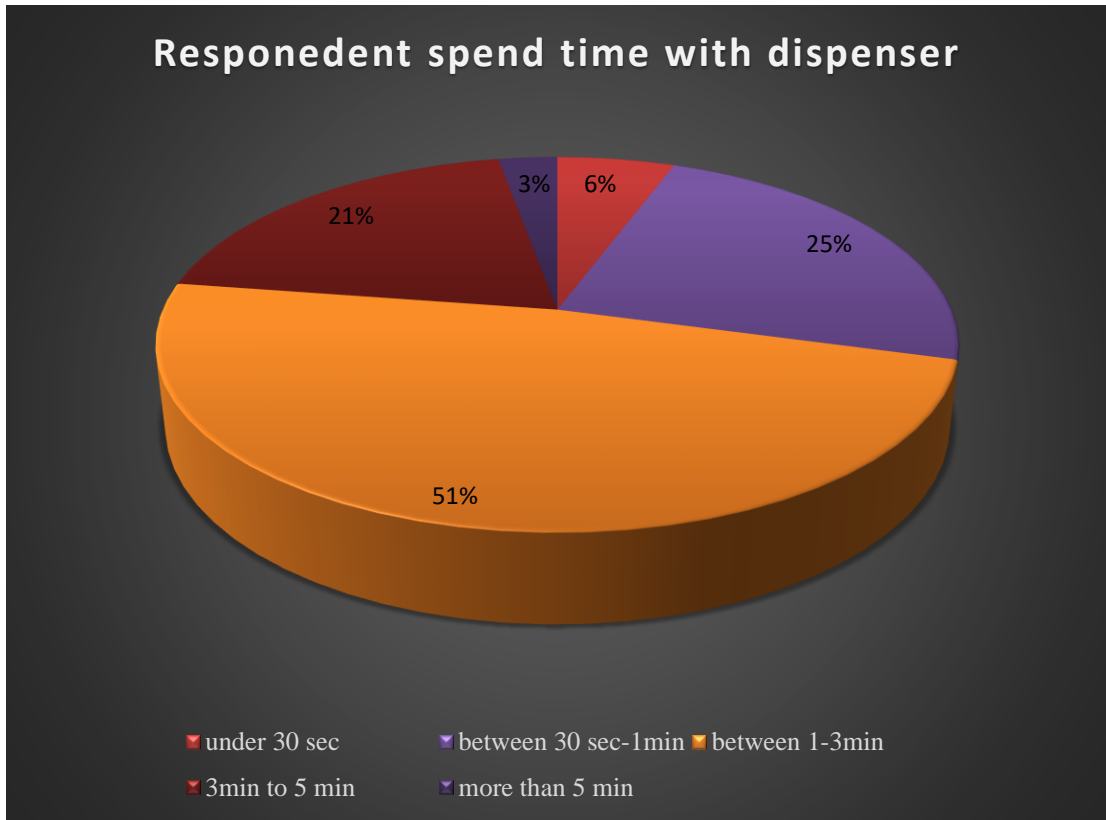Information given by dispenser

fig 3

APPENDICS

Participant InFormation Sheet and InFormed Consent Form

Good morning/afternoon?

……………………………. We are working as a data collector for the study being conducted in this Harar General Hospital facility research on   "Dispensing Practices and Quality of Pharmaceutical Services Given at private Hospital in Harar Town

". So, I kindly request you to lend me your attention to explain you about the study and being selected as the study participant.

The study/project title:

"Dispensing Practices and Quality of Pharmaceutical Services Given at private Hospital in Harar town of at Harar General Hospital, Harari regional state".

Procedures and duration

We will be interviewing patients using a questionnaire to provide pertinent data that is helpful for the study. There are 25 questions to answer where I will fill the questionnaire by interviewing you. The interview will take about 20 minutes, so I kindly request you to spare me this time for the interview.

Risks and Benefits

The risk of participating in this study is very minimal, but only takes a few minutes from your time. There would not be any direct payment for participating in this study. However, the findings from this research may reveal important information for stockholders or local health planners.

References
1.	(WHO) WHO. Promoting rational use of medicines: core components. In: WHO Policy Perspectives on Medicines No. 5. 2002.
2.	Remington: GP. The Science and Practice of Pharmacy. 21st ed., Philadelphia. Lippincott Williams& Wilkins. 2005;2:1770-1773.
3.	(FMHACA). FMHaacaoE. Manual for good dispensing practice, Addis Ababa; DACA:. 2007:1-29.
4.	Quick JD RJ, Laing RO, O'Connor RW, Hogerzeil HV, Dukes MNG, Garnett A. ., : 1997. Managing DrugSupply. 2nd ed. West Hartford; Kumarian Press. 1997.
5.	(WHO/DAP) WHOAPoED. How to investigate drug usein health facilities: selected drug use indicators,. Geneva; WHO/DAP. 1993.
6.	(DACA). DAacAoE. Promoting rational use of drugs. DACA (FMHACA). Drug Information Bulletin. 2004;2(1):1-10.
7.	Zewdie D JY, Gebre Mariam T. Drug utilization studies: Methods and uses. Ethiop Pharm J. 1999;17: 44-50.
8.	(HKMA). HKMA. Good dispensing manual, 2nd ed. Hong Kong; HKMA. 2007.

9.   during PiiondpiA. Report on working meeting. agency on drug and medical technology Yerevan. 200.

10.   Teferra A AW. patient noncompliance with therapeutic regiments and the factor of noncompliance in Gonder. Ethiopia journal of health development. 2000;1491:1-6.

11.   FMHACA. Assessment of pharmaceutical sector in Ethiopia. Ethiopia pharmaceutical j. 2001.

12.   Yabite H TS, Wabe NT. Historical Background. Drug Inf J, . 2012;46(6):688-693.

13.   WHO. How to investigate drug use in health facilities,Drug use indication Action Programme on Essential Drug. WHO: Geneva. 1995:877.

14.   Hogerzeil HV B, Ross-Degnan D, Laing RO, Ofori-Adjei D, Santoso B, Azad Chowdhury AK, DasAM, Kafle KK, Mabadeje AF, et al. . Rational use of Medicines. Lancet. 1993;342:1408-1410.

15.   Caamaño F T-OM, Figueiras A, Takkouche B. . Factors related with prescription requirement to dispensing in Spain. Pharmacoepidemiology Drug Saf. 2004;13:405-409.