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ASSESSMENT OF DISPENSING PRACTICE IN SOUTH WEST ETHIOPIA: THE CASE OF JIMMA UNIVERSITY SPECIALIZED HOSPITAL

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ABSTRACT

Dispensing is a crucial part of drug use process. This study aimed at assessing quality of dispensing in Jimma University Specialized Hospital Outpatient Pharmacy. A prospective participatory observation of dispensing process and interview of patient were conducted using checklist and semi structured questionnaire. World Health Organization patient care indicators and other quality indicators were employed. Pearson Chi-Square test was used to determine association and P<0.005 was considered statistically significant. Average number of drugs per prescription was 1.84 and 81% of prescriptions were fully dispensed. Mean labeling score was 2.5 and mean dispensing time was 22.5 seconds. Mean knowledge score was 2.8 and 69% of patients had adequate knowledge. Adequate knowledge was significantly associated with educational status (p<0.005). Correct dosage was recalled by 79% patients and knowledge about correct dosage was significantly associated with age and educational status (p<0.005). Inadequate labeling, short dispensing time and unavailability of essential drugs and dispensing aids reflect discrepancies in quality of care.

Key words: Knowledge score, Labeling score, Dispensing time, and Correct knowledge on dosage, Adequate Knowledge and Dispensing aids

INTRODUCTION

Dispensing practice plays a major role in the provision of rational drug therapy. It begins with 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 integrity of drugs [1-4]. According to 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 quality of drug therapy, wastage of resource, increased treatment cost, increased risk of adverse drug reaction and emergence of drug resistance [5-8]. However, efforts have been concentrated on ensuring rational prescription; and quality of dispensing have been overlooked [9-11]. Several report from both developed and developing countries indicate that incorrect dispensing, self medication and use of sub therapeutic doses to be major causes of irrational drug use [12]. Since pharmacists provide drug information during dispensing, they have 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 about the use and side effects associated with medications prescribed [2,13,14].

Different studies done in developing countries like India, Pakistan, Nepal, Cambodia, Iran, Botswana, Nigeria and Sudan revealed gaps in quality of dispensing indicated by poor practice of labeling,

short dispensing time, and poor patient knowledge [5, 7, 8, 15-20]. In Ethiopia, poor understanding about medications leading to non adherence is common phenomenon indicated by different studies [21-24]. This might have been attributed by poor dispensing practices. But, commencing from 2008 there was a paradigm shift in pharmacy curricula to provide patient oriented pharmaceutical services rather than product oriented. The aim of this move was to involve pharmacists in patient care and promote rational use of drugs in order to meet the bench marked pharmacy services in the recent hospital reform implementation guideline by Ethiopian Ministry Of Health, [25] Even though there are studies conducted in Ethiopia assessing rational drug use practice [14, 21, 22, 24], a comprehensive study assessing dispensing practice is lacking particularly in Jimma University Specialized Hospital (JUSH). Therefore, the objective of this study is to assess the quality of dispensing at JUSH outpatient pharmacy.

MATERIALS AND METHODS

Study area and period: The study was conducted in Jimma University Specialized Hospital, geographically located in Jimma, 352 km Southwest of Addis Ababa. The hospital is one of the oldest public hospitals in Ethiopia and it is currently the only teaching and referral hospital in South western part of the country. It provides services for approximately 9000 inpatient and 80000 outpatient attendances a year coming to the hospital from catchment population of about 15 million people [26]. The clinical services given at the hospital are adult medical outpatient department (OPD); surgical OPD; paediatric OPD; medical and surgical referral and follow-up; dental care and treatment; dermatological and venereal disease care and treatment; ophthalmology; psychiatry; physiotherapy; orthotic and prosthetic services; inpatient services for medical, surgical and trauma patients. Laboratory, pathology and radiology services are also given within the hospital. The Pharmacy services offered are inpatient pharmacy, outpatient pharmacy, local formulation preparation and drug information. The study was conducted from January 1 to 29, 2013 on patients attending the outpatient pharmacy.

Study design: The study was a prospective participatory observation of drug dispensing process, based on interview of patient about their knowledge on dispensed drugs using a semi- structured questionnaire and assessment of dispensing process using checklist. WHO patient care indicators and other quality indicators were employed to assess the quality of dispensing practice. Sample size was determined by using single proportion formula. So, a total of 384 patients who came to outpatient pharmacy during the study period were included in the study. All clients who received pharmaceutical services during the study period except emergency patients, patient undergoing Direct Observed Therapy short course (DOTs) for tuberculosis, patients who came for refill and oral consult patients were included in the study.

Data collection: Pre- tested semi-structured questionnaire and checklist were used to collect the information on patient knowledge and label on dispensed drugs; and dispensing aids respectively. The questionnaires were translated into *Amharic* and *Afan Oromo* and were back-translated into English to check for accuracy. Data was collected by trained final year undergraduate pharmacy students who had excellent writing, reading, spoken production and interaction ability in *Amharic*, *Afan Oromo* and *English*. The consultation was observed without active participation of research team to minimize observer bias. All observers were instructed not to interfere with the dispensing process. The research team also recorded the duration of the dispensing process. In order to avoid dispenser bias the data collectors recorded information from each package dispensed to patients as the patient left the drug outlet, using checklist. In addition to that, exit interviews were also made with the clients in order to assess their understanding of the information they received by using a semi-structured questionnaire. The data collection was supervised and coordinated by supervisors. At the end of each day, the questionnaires were checked by supervisors for omission and completeness.

Ethical considerations: The study was conducted upon the ethical clearance of Jimma University Ethical Board. Support of JUSH administration and the pharmacy staff as well as verbal consent of participants was obtained prior to study initiation. Patient related data was confidential and was destructed after forming database.

Statistical analysis: The collected data was, cleared, categorized, coded and it was entered into SPSS (Windows v 16.0; SPSS Inc, Chicago, IL). Descriptive statistics were generated and Pearson Chi-Square test was used to determine association and $P<0.005$ was considered statistically significant.

Calculation of scores and indicators: *Average counseling time:* was calculated by dividing the total counseling time during encounters by the number dispensing.

Average number of drugs per prescription: was calculated by dividing the total number of drugs prescribed by total number of prescriptions

Labeling score: was calculated by considering five essential dispensing quality attributes: name of patient and generic name, strength, dosage and quantity of the drug. Correct labeling was given a score of 1 per attribute and incorrect or no labeling was scored 0, and the total dispensing score for each drug was calculated (maximum total score of 5 per drug dispensed). A score of 2.70 and above was regarded as a satisfactory quality of labeling, representing 54% of the total score [5].

Percentage of drugs adequately labeled: was calculated by dividing the number of drug labels (containing name of patient and generic name, strength, dosage and quantity) by total number of dispensed drugs, multiplied by 100.

Percentage of prescriptions fully dispensed: was calculated by dividing the number of dispensed prescriptions by total number of prescription papers, multiplied by 100.

Percentage of patients with correct dosage: was calculated by dividing the number of patients who can adequately explain back about the dosage schedule for all drugs they received by total number of patients interviewed, multiplied by 100.

Patients' knowledge score: was calculated by assessing patients recalling ability of name of the drug, dosage, duration of treatment, and reason for prescription. For each of the attributes a correct answer was assigned a score of 1 and an incorrect answer 0. For each drug the total knowledge score was calculated (maximum knowledge score of 4 per drug). The mean knowledge score by group of drugs was calculated; a score of 2.40 and above was regarded as a satisfactory level of knowledge, representing 60% of the total score [5].

Percentage of patients with adequate knowledge: was calculated by dividing the number of patients (who recalled name of the drug, dosage, duration of treatment and reason for prescription) by total number of patients interviewed, multiplied by 100.

RESULTS

Socio-demographic characteristics: A total of 384 patients were included in the study. Out of the clients included in the study 278 (72%) were males and majority of them (53.4%) were in the age group of 20-30 years and 37% attended higher education (**Table 1**).

Dispensed drugs and their labeling pattern: In this study 81% of the prescriptions were fully dispensed, 14% of prescriptions were partially dispensed while 5% of prescriptions were not dispensed. The average number of drugs per prescription was 1.84. During this study, 628 drugs (90.4%) were dispensed, of which 26% were antibiotics. All the drugs were dispensed either in their original packs or in readymade paper or plastic envelopes. Generic name, strength, dosage, and quantity were written on 100%, 97%, 61% and 42% of the labels respectively. Patient name was not written on any of the labels. In addition, the dosage of the drug was written only on 59% of Central Nervous System (CNS) drugs and 23% of Vitamins and Electrolytes. The mean labeling score for dispensed drugs was 2.5 with a peak of 3.1 for CNS drugs (**Table 2**). The mean dispensing time spent on an individual client was 22.5 seconds and none of the drugs were adequately labeled (**Table 3**).

Patient Knowledge and factors influencing it: Name of drug, dosage, duration of treatment and reason for prescription were recalled by 39%, 79%, 89% and 76% of the clients respectively. Patients' knowledge about correct dosage of dispensed medications was significantly associated with age and educational status, P<0.005 (**Table 4**) and there was no statistically significant association between patients' sex and correct knowledge on dosage. The mean knowledge score of patients was 2.8; with a highest 3.1 for anthelmintic drugs (**Table 2**). Knowledge score about dispensed medications was significantly associated with educational status of clients, P<0.005 (**Table 4**), but there was no association with age and sex.

The knowledge score of respondents who attended higher educational institutes (3.4) was higher when compared to those who didn't receive any formal education (2.4). In addition, higher knowledge score was observed in [20-30 years] age group (**Table 5**). Furthermore 69% of the patients had adequate knowledge about their medications.

Drug information source and pharmacy dispensing aids: 90% the respondents said that they received drug information about the dispensed medications via the pharmacists while 10% stated that their source were the prescribers. The pharmacy dispensing aids available were dispensing spoon, spatula, mortal and pestle, and balance. But, dispensing aids such as triangular tablet counters, capsule counter, pan

weighing scale and measuring cylinder were not available.

DISCUSSION

The drug dispensing system in a health facility needs to be evaluated in order to improve efficiency of the dispensing practice which is essential for patient care. In this study a total of 628 drugs (90.4%) were dispensed to patients. This value is greater when compared to drugs dispensed in Tikur Anbesa Specialized Hospital, Saint Paul's Specialized Hospital [14] and northern part of Ethiopia (83.13%) [21]. The number of dispensed drugs is also higher than Nigeria [19] but less than Cambodia [17]. Although WHO recommends 100% drug availability this is not yet realized [12]. But, increased number of drugs dispensed in comparison to other studies could indicate a better pharmaceutical stock management system. The average number of drugs per prescription in this study was 1.81, which is less than the national value (1.99) and other studies done in developing countries [7, 16, 18-20, 24]. Therefore, it can be inferred that the level of poly pharmacy is low and it could also be a reason for satisfactory level of patient knowledge on dispensed drugs (70%) despite a dispensing time of 22.5 seconds. Since labeling helps to inform patients about the use of a specific drug, specific instructions should be placed on the package/envelope of each drug in language/signs which the consumers can easily understand. Furthermore dispensing practice specifically labeling affect patient knowledge which could in turn affect adherence [9]. In this study all the dispensed drugs were labeled with their generic name while none of the prescriptions had patient's name. This could be due to dispensers' assumption that the names of patient are not that important. But, the name of the patient should be written as their chances that a patient/patient attendant could buy drugs for more than one person within his/her household and not labeling it with patient name could lead to mix-ups. Adequate labeling is a means of delivering message about a drug as a result, proper labeling reduces drug induced toxicities or reactions and increases the efficacy of drugs. In addition, the extent of labeling clearly indicates the level of care provided. In this study patient name, generic name, strength, dosage, and quantity were written on 0%, 100%, 97%, 61%, and 42% of labels respectively. In Botswana patient name (44%), generic name (73%), strength (50%), dosage (77%), and quantity (32%) were written on labels [5] and in western Nepal 0.4%, 82.6% and 87% of labels had patient name, generic name and strength [16]. Nevertheless, none of the drugs were adequately labeled according to the correct drug labeling criteria. Studies in Iran, Nigeria, Sudan showed that adequate labeling criteria were met in 84% [17], 37.6 % [19] and 12% [20] of the drugs respectively. The mean labeling score for the drugs dispensed was 2.5 and it less than Botswana (2.75) [5]. The mean labeling score accounted 50% of the total score indicating unsatisfactory level of labeling. The highest labeling score for CNS drugs (3.1) could be attributed to the emphasis given by the pharmacists to label these drugs in order to provide all the essential information to the clients since most psychiatric patients have different emotional behaviors that might lead non-compliance. In general all patients should receive essential information on drugs prescribed to them in order to maximize the benefits they obtain from their medications. Pharmacists have an important role in providing drug information for patients to minimize medication errors especially related to dose causing unnecessary morbidity and mortality in patients receiving drugs. In this study the percentage of patients with correct dosage were 79% which is equivalent to the study done in Botswana [5] and Pakistan [7]; and greater than the study in Cambodia (50%) [17] and northern part of Ethiopia [22]; despite WHO recommendation of 100%. Reason for prescription was recalled in 76% of the patients which was greater than the study done in India [15] and Iran [18], but lower than Botswana [5]. It is important to orient the patient about the reason of prescription during dispensing as it can increases adherence of patients to their medicines. The name of the drug was recalled only by 39% of the clients, which is comparable with the primary health care in Botswana (31%) [5]. Duration of treatment was recalled in 89% of the drugs dispensed, which is higher than the value in Botswana (44%) [5]. Correct dosage was recalled by 79% of clients comparable to Botswana (83%) [5]. In addition age and educational status of the patients were significantly associated with knowledge about correct dosage ($P < 0.005$). The mean knowledge score was 2.8, greater than Botswana (2.5) [5]. The Mean knowledge score accounted 70% of the total score indicating satisfactory level of knowledge. The mean knowledge score was highest in patients who attended higher education and it was the lowest in patients who did not had formal education. The reason for lowest knowledge score in patients who did not receive formal education could probably be due to miscommunication as a result of medical jargons usage. The mean knowledge score for anthelmintic drugs was higher than that of others. This might be due to familiarity of these drugs to most patients as a result of frequent use since helminthic infestation is very common Ethiopia. But the highest knowledge score might not necessary

imply that the patients have the all the required knowledge about anthelmintic drugs. 69% of patients had adequate knowledge, similar to northern part of Ethiopia 67.4% [22], but higher than Sudan (37.2%) [16]. Furthermore, educational status of the patients was also significantly associated with adequate knowledge (P <0.005). Despite, the recommendation of WHO, stating that a pharmacist should spend at least 3 minutes during dispensing to provide adequate pharmaceutical orientation [12]. The average dispensing time in this study was found to be short (22.5 seconds) which was comparable with dispensing time in Botswana (25 seconds) [5] and Sudan (21.8 seconds) [20] but it was shorter than Cambodia (45 seconds) [17] and Pakistan (52.5seconds) [7]. The unsatisfactory labeling and gaps in patient knowledge observed in this study could be attributed to the short dispensing time. Apart from the discrepancies observed in availability of essential drugs, labeling practice and dispensing time, dispensing aids required to provide optimal dispensing were not available. The synergistic effect of which could affect the quality of dispensing and finally the quality of care offered to patients. Therefore, further interventional studies should be conducted in order to develop corrective action plans, regulations and policies.

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Table 1: Socio-demographic characteristics of patients in JUSH outpatient pharmacy, January 2013

Demographic characteristics		Number of respondents (%)
Sex	Male	278 (72)
	Female	106(28)
	Total	*384(100)*
Age	< 20 years	44(11.4)
	20-30 years	205(53.4)
	> 30 years	135(35.2)
	Total	*384 (100)*
Educational status	No formal education	100(26)
	Read and write	42(11)
	Elementary school	64(17)
	Secondary school	36(9)
	Higher Education	142(37)
	Total	*384 (100)*

Table 2: Mean labeling score and patient knowledge score for different drugs groups dispensed in JUSH outpatient pharmacy, January 2013

Drug groups	N (%)	Mean labeling score	Mean knowledge score
Antibiotics	166(26)	2.36	2.8
Anthelmintics	22 (4)	2.18	3.1
Antiprotozoals	18 (3)	2.1	3.1
Analgesics	120 (19)	2.27	2.9
CNS drugs	102 (16)	3.1	2.8
CVDs	44 (7)	2.1	2.4
GIT drugs	56 (9)	2.5	2.9
Vitamins and Electrolytes	44 (7)	2.9	2.9
Respiratory drugs	18 (3)	2.4	2.7
Dermatological drugs	22(3.5)	2.5	2.8
Others	16 (2.5)	2.3	2.8

*CNS drugs (Central Nervous System), CVDs (Cardiovascular Drugs), GIT drugs (Gastrointestinal Drugs)

Table 3: Summary of core dispensing indicators in JUSH, January 2013

Dispensing indicator	Values
Percentage of prescription fully dispensed	81%
Percentage of drugs adequately labeled	0%
Percentage of patients with correct dosage	79%
Percentage of patients with adequate knowledge	69%
Average dispensing time	22.5 seconds

Table 4: Adequacy of patient knowledge (knowledge score) and knowledge about correct dosage according to educational status and age of patients in JUSH outpatient pharmacy, January 2013

Variables	Adequate patient knowledge		Knowledge about correct dosage	
	N (%)	X^2 test	N (%)	X^2 test
Educational status				
No formal education	64(64%)	x^2 =17.9	72(72%)	x^2 =21.7
Read and write	22(52%)	p=0.001	28(67%)	p=0.000
Elementary school	38(59%)		43(67%)	
Secondary school	26(72%)		32(89%)	
Higher Education	114(80%)		127(89%)	
Age				
< 20 years	30(68%)	x^2 =9.5	36(82%)	x^2 =13.9
20-30 years	154(75%)	p=0.008	174(85%)	p=0.001
> 30 years	80(59%)		92(68%)	

Table 5: Knowledge score of patients according to educational status and age in JUSH outpatient pharmacy, January 2013

Variables	Knowledge score
Educational status	
No formal education	2.4
Read and write	2.5
Elementary school	2.8
Secondary school	2.9
Higher Education	3.4
Age	
< 20 years	2.6
20-30 years	3.1
> 30 years	2.7

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