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EVALUATION OF DISPENSING ERRORS IN SHEGAR OROMIYA, ETHIOPIA: FREQUENCY, KIND, AND CAUSES

Takele Achalu Dengela*

Lecturer at Africa Medical, P o box 80289 Addis Ababa Ethiopia.

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***Corresponding author:**

***Takele Achalu Dengela**

Lecturer at Africa Medical, P o box 80289 Addis Ababa Ethiopia.

ABSTRACT

Introduction: The goal of dispensing is to guarantee that the appropriate medication is administered to the appropriate patient in the appropriate dosage, the appropriate form, with the appropriate instructions, and in a container that preserves the medication's efficacy. The amount of data from Shegar Oromiya Primary hospitals in Ethiopia, however, is insufficient to determine the magnitude of dispensing error and its cause. **Objective**: Determine the various types of dispensing errors, their causes, and their occurrence in the pharmacy at Primary hospitals in Shegar Oromiya Ethiopia to enable taking the necessary measures. **Method:** From March to June 2022, a cross-sectional prospective study in the OPD pharmacy at Primary hospitals in Shegar Oromiya Ethiopia was carried out using a systematic observational check list. (EPH). To further look into the potential causes of the dispensing error, extensive interviews with the hospital's pharmacists and druggist were also done. **Result:** In this study, 384 patient prescriptions were examined, and the dispensing errors that were discovered were divided into four groups: errors in patient identification, content, labeling, and teaching or counseling of patients. In total, 384 prescriptions were written; of these, 27.9% were missing the patient's name, 59.9% were missing their age, and 59.9% were written without the patient's sex having been verified beforehand. Among the 733 medications prescribed, only 7.3% contained labels including the drug name, patient name, patient's age, sex, and usage instructions. There are no warnings or expiration dates on the labels of any pharmaceuticals. 11.5% of folks are also familiar with drug storage locations. No one among the 384 patients tested knew how to manage any of the drugs' negative effects. **Conclusion:** This study revealed four primary categories of dispensing errors in EPH: patient identification, substance, labeling, and counseling problems. Labeling and patient identification receive the highest percentages, but content error and counseling error receive the lowest percentages. The pharmacist/druggist has identified a number of factors that contribute to dispensing errors, such as heavy patient workloads, illegible handwriting, unfavorable dispensing conditions, a lack of hospital pharmacy work flow systems, and others.

KEYWORDS: Drug dispensing error, prevalence, EPH, and OPD pharmacy.

1. BACKGROUND INFORMATION

The majority of people on the planet periodically use medication. Drugs are mostly beneficial or at the very least don't hurt people, although on occasion they could be harmful to the user (Goulding, 2016). These risks can occasionally be linked to avoidable mistakes made when

taking medications. Errors can happen at any stage of the medicine distribution process in hospitals. starting with the drug purchase and continuing through the prescription, administration, dictation, dispensing, and impact monitoring (P. Aspenden, 2016). It is a major concern in the healthcare industry because medication errors might result in serious morbidity and mortality. According to a report from a medical facility, medical errors are the sixth biggest cause of mortality and are responsible for 44,000 to 98,000 fatalities annually (RR, 1996). Any step in the prescription, distribution, or administration of medication might result in a medication error if a pharmacist, physician, nurse, or other member of the medical staff makes a mistake (CheraGhalietal, 2004). In the hospital setting, many prescription errors occur during the many phases of medicine administration. One of the most delicate phases of the procedure is dispensing (Scot, 2012).

The right drug is provided to the right patient in the proper dosage and quantity, together with clear instructions, thanks to effective dispensing processes. The dispensing process is made up of all the steps that take place between the moment a patient or care provider gives a prescription or verbal request and the time that drugs or other things are given to that individual (FMHACA, 2011). Any unexpected departure from a precise written prescription or medicine order is considered a dispensing error. A dispensing error is any unintentional departure from regulatory requirements, prescription specifications, or suggestions that affects dispensing procedures (Basao-Adnan, 2005). Bate, D. W. Five key phases should be carried out during the dispensing cycle when following outpatient dispensing protocols (Borney, 2007). (Hawiyabite). Receiving and authenticating a prescription or verbal request is the first step. The pharmacist should now ask the patient for their name and confirm it matches the name on the prescription. Asking for an identification card will allow you to double-check the patient's name and identity if you have any doubts. Additionally, while issuing the things, this must be done.

The second step entails comprehending and interpreting the prescription. It requires carefully performing any dose calculations and amount computations, checking the printed prescription, making any necessary revisions with the prescriber's agreement. The third is getting goods ready for distribution. The right medication needs to be gathered, counted or poured, appropriately packaged, and labeled during this phase. The fourth phase consists of recording, documenting, and reporting. The procedure is completed by giving the prepared, packaged, and labeled medication to the appropriate patient or healthcare professional along with the pertinent drug information, such as when and how to take the medication, frequency, and length of therapy (FMHACA, 2011). Hospital outpatient pharmacy and community pharmacies both have up to 24 percent and 12.5% prescription dispensing error rates, according to studies done in the USA (AllanEL, 1995). Any failure in any stage of the distribution process may considerably impact the patient's health and may even cause death unless the pharmacist dispenses the right medication in the right amount and provides adequate information about the substance.

The economics of the country and the wellbeing of the patients are both impacted in different ways by dispensing error. Serious dispensing mistakes may increase patient morbidity and mortality, increase hospital and medical care costs, damage the pharmacist's reputation and status in the profession, open the door to legal action, and cause financial loss. The length of the patient's illness, the need for more extensive medical treatment, and lost productivity could all be the outcome of a dispensing procedure error.

The nation's economy is burdened by the time needed to seek medical attention as well as the lost productivity (Rosenfeild injury). Dispensing mistakes have the potential to cause patients considerable harm, but this area of research hasn't gotten much attention. The amount of research on this area has significantly increased, and concerns about the growing number of people hurt by prescription errors are becoming more widespread (AllanEL, 1995). No study indicating the scope of pharmaceutical error, in particular the dispensing error, was conducted at primary hospitals in Shegar Oromiya Ethiopia and published.

This study was done to help the pharmacy at Primary hospitals in Shegar Oromiya Ethiopia take the appropriate action by identifying the types of dispensing errors, their prevalence, and their causes.

2. METHODOLOGY

2.1 Study Area and period

The study was conducted at the OPD pharmacy in sheger city is sprawling across an area of 1,600 square kilometers (160,000 hectares). To put the cost in perspective, the price tag for Egypt's new city that covers 700 square kilometer (70,000 hectares) ,and sheger city Primary hospitals in Shegar Oromiya Ethiopia Primary hospitals in Shegar Oromiya Ethiopiais.

2.2. Study Deign

The study employed a cross-sectional study design to determine the prevalence of dispensing errors and characterize their various forms. In-depth interviews with pharmacists and druggists at pharmacies were done to find out more about the errors' alleged causes.

2.3. Population

2.3.1 Study population

All patients who arrived with prescriptions were processed by the EPH OPD pharmacy and had their medications supplied during the research period. All willing druggists and pharmacists employed by the EPH OPD pharmacy.

2.4. Inclusion and Exclusion criteria

2.4.1 Inclusion criteria

- ✓ All the prescriptions papers with drug that are actually dispensed.
- ✓ All Pharmacy department staff members who are volunteer was included.

2.4.2 Exclusion criteria

- ✓ All drugs that is prescribed in EPH but not available in Pharmacy for dispensing.
- ✓ All prescribed supplies and equipment.

2.5. Sample Size and Sampling Technique

2.5.1. Sample Size

In this survey, total population is greater than 10,000.The sample size was determined by the following statistical formula.

$n=z^2p\ (1-p)/d^2$

Where, n is sample size required for study
Z is standard deviation at 95% confidence interval and d=0.05 which is 1.96
p is absolute sampling error that can be tolerated which is 0.5 since it's not known.
Thus
$n= (1.96)^2*0.5*0.5/ (0.05)^2=$**384**

2.5.2 Sampling Technique

Convenient random sampling was used to select 384 prescriptions and each prescription was observed.

2.6. Study Variable

Dependent variable

- ✓ Types of dispensing error
- ✓ Perceived cause of dispensing error

Independent variable

- Socio-demographic characteristics -age, sex, work experience, qualification.

2.7. Data collection, Instrument and Methodology

In-depth interviews and a checklist were employed, respectively, to gather information on the different types, incidence rates, and root causes of dispensing error. The checklist is used to assess indicators of medicine delivery, including patient identification, pharmaceuticals that have been dispensed, labeling, and patient education and counseling. Data were collected utilizing a participatory observation technique without disclosing to the dispensers the precise title of the study or interfering with the distribution procedure. A thorough interview with the druggist and pharmacist of the drugstore was conducted in order to further investigate the error's likely source.

2.8 Data Processing, Analysis and Presentation

The data was structured using descriptive statistics in IBM/SPSS version 21 and displayed as tables and texts. The data was generated using dummy tables and tally sheets.

2.9. Operational definition

Content error: Errors involving erroneous content included those involving the wrong drug, the wrong strength, the wrong dose form, the wrong quantity, and any expired medications.

How to take drug: how a medicine is administered (with water, chewing or swallowing)

How to store the drug: the location where the medicine is kept (avoid heat, light and dampness and to keep drug out of reach of children)

Incorrect drug: distributing a medication that is not what was prescribed. excludes generic or therapeutic substitutions approved in writing by the hospital.

Incorrect dosage form: distributing a dose unit containing the appropriate drug in the wrong dosage without correctly altering the dosing guidelines.

Labeling error One of the faults people make while labeling products is forgetting to include the name of the drug, its strength, the patient's name, the quantity, the expiration date, and the dispenser's name. They also dispense without labeling.

When to take the drug: The time at which the drug is taken (e.g. before or after meals)

2.10 Ethical consideration

After obtaining the necessary consents, the Africa Medical College ethics review committee granted EPH, the outpatient pharmacy where the study was conducted, ethical permission. Before the study started, participants gave their consent to take part. They were informed of the study's goals, how and why they were chosen to participate, what is expected of them, and that they have the right to withdraw from the study at any moment during the consent process. By eliminating the use of personal identifiers and evaluating the data in aggregates, participants were given the assurance that the information gathered throughout the course of the study would remain confidential.

3. RESULT

3.1. Dispensing errors associated with patient information

After obtaining the necessary consents, the Africa Medical College Ethics Review Committee granted EPH, the outpatient pharmacy where the study was conducted, ethical approval. Before the study started, participants gave their consent to take part. They were informed of the study's goals, how and why they were chosen to participate, what is expected of them, and that they have the right to withdraw from the study at any moment during the consent process. By eliminating the use of personal identifiers and evaluating the data in aggregates, participants were given the assurance that the

information gathered throughout the course of the study would remain confidential.

Table 1: Distribution of Dispensing errors associated with patient information and its percentage relating with number of prescription observed from EPH, Outpatient Pharmacy Jul 2022 (n=384)

Patient information	Number	% with no prescription observed
Dispensing without checking the patient's name	107	27.9%
Dispensing without checking the patient's age	230	59.9%
Dispensing without checking patient's sex	230	59.9%

3.2. Dispensing errors

384 people received 733 medicines due to a content error. There are no difficulties with faulty medication, incorrect strengths, inappropriate dose forms, or expired drugs because there were no reported content errors. Only 62 individuals (8.5 percent, n = 733) received an incorrect dosage. Out of 733 drugs that were delivered, the majority were still in their original packaging, and the remaining were distributed in pre-made plastic envelopes (Table 2). This information relates to labeling problems.

Table 2: Distribution of labeling error (absence of labeling) and its percentage relating with number of drug dispensed observed from EPH, Outpatient Pharmacy Jul 2022.

Labeling pattern	Number of error	% with no of drug dispensed
Patient name	356	92.7
Drug name	356	92.7
Drug strength	356	92.7
Direction for use	356	92.7
Cautionary on label	384	100
Expiration date	384	100

3.3. Error during Patient instruction or counseling

87% of the 384 patients knew how much and when to take their meds and had verbal instructions. Of those, 66.7% were aware of how long they ought to take. Drug usage is widespread among the 72.9 percent. Furthermore, just 11.5% of patients are aware of how to properly store medications. No patient is aware of the medication's side effects, safety precautions, or warnings (Table 3).

Table 3: Distribution errors during patient instruction and counseling and its percentage with total prescription observed from EPH, Outpatient Pharmacy Jul 2022.

Patient counseling and instruction	% of patient respond correctly	
	Number of patient	%
How many/much to take	334	87%
How long it should be taken	256	66.7%
How to take	280	72.9%
SEs, warnings and/or precautions with their management	0	0
Where to Store	44	11.5

3.4. Cause of dispensing error

Data from 14 pharmacy department employees who were questioned about the factors impacting dispensing errors revealed that 11 of them worked an average of 8 hours per day, the other 10 to 16 hours per day, and nearly all of them adhered to the recommended daily working hours. When dispensing more frequently, half of the 14 employees experience fatigue, tension, and other activity limitations. To cope with this, they frequently snooze, take showers, and drink coffee and tea.

Five of the dispensers were extremely satisfied with their jobs as pharmacy technicians/dispensary pharmacists since beginning their employment with EPH, seven were satisfied, and two were not. Three of them state that they are content with the working conditions at the hospital pharmacy, including the staff members present, the workspace, the shelving and storage places, the equipment, and the packing materials. Eleven of them advocate reform and improvement in the proposal on the area of the EPH used for working, shelving, and storage. They all confirmed that there isn't a work flow system or SOP in place at the EPH outpatient pharmacy to guarantee the effectiveness and caliber of dispensing practice. All of them state that it is because to a high volume of prescriptions, unclear handwriting, the

carelessness of the staff distributing the medication, or a poor dispensing environment. The most frequent factors contributing to potential dispensing errors in the EPH OPD pharmacy include choosing the incorrect medications because of comparable packing materials, interruptions during counting, and insufficient opportunity counseling. Some of them suggested that adding more personnel, setting up a work flow system of SOP, and providing the appropriate facilities might lessen or eliminate the dispensing mistake in the EPH OPD pharmacy (Table 4).

Table 4: Socio demographic characteristics of the respondents from EPH, Outpatient Pharmacy Jul 2022.

Variables		No	Percentage
Age	23-30	7	50
	31-38	5	35.7
	39-46	1	7.1
	47-54	1	7.1
	>54	0	0
Sex	F	5	35.7
	M	9	64.3
Qualification	Pharmacist	13	92.9
	Druggist	1	7.1
Experience	0-2(Junior)	4	28.57%
	2-5 (Senior)	4	28.57%
	6-10(Chief)	6	42.85%
	>11(Expert)	0	0%

4. DISCUSSION

After 384 patient prescriptions were examined, four different types of dispensing issues were found in this study: patient identification errors, content errors, labeling errors, and counseling errors. Total number of prescriptions filled without first verifying the patient's name: 27.9% (n=384). The first step in ensuring correct medicine administration is for the pharmacist to ask the patient to check the name on the prescription. If there is any doubt, request an identification card from the patient. If this isn't done, the medication can end up in the wrong hands (Kumarianpress, 1997).The filling of 59.9% of the 384 investigated prescriptions took place without first establishing the patient's age and sex (n=384). The sensible selection of a drug's dosage and dosing form takes the patient's age into account. Giving medication without first ascertaining the patient's age may lead to either therapeutic failure or overdosage because the dose recommended for an adult differs from that of a child (Kumarianpress, 1997).

Only 8.5% of the 733 drugs delivered had content errors, which is the highest rate of content errors but the lowest total proportion when compared to other dispensing issues such patient identification errors, labeling errors, and counseling errors. The drug may not be effective and may even be dangerous if the patient receives less or more medication than is recommended. Each of these has a detrimental effect on the patient's health. According to BoonstraE (2003), adequate labeling is described as a label that contains the patient's name, the medication's strength, quantity, dose, and length of therapy. This number might seem exaggerated, but at the time of observation, there were about four errors in one prescription paper, and these errors are even regarded as normal in pharmacies since dispensers always fail to label them. In our observational study, 92.7% of drugs were dispensed without labeling the patient name, drug name, strength, even directions for use, and none of the drugs contained caution or warning.

The labeling on dispensed pharmaceuticals serves to both clearly and concisely explain to the patient how to use the medication and to identify the container's contents. Therefore, the drug box should be printed with clear instructions in a language that the patient can understand (Hawiyabite).

The bulk of the items that were distributed in this observational experiment were not labeled with the patient's name. The wrong patient (family members, acquaintances, neighbors, etc.) may mistakenly use the medication if the patient's name wasn't written on the label.

Compared to Botswana's 50% statistic in the survey (Bate DW, 1997), 7.3% of drugs have their strength mentioned on the label. This higher percentage was thought to be caused by the fact that most medications, including those in blister packs of tablets, ampoules, and bottles, were given out in the original packaging that was already labeled with their strength. The patient gains many advantages from counseling, which is also a highly effective method of minimizing error. According to a North Carolina estimate, early and proper counseling could have prevented 50% of medication-related deaths (RR, 1996).

In our observational study, 87 percent of the patients receive verbal instructions on how much to take, 66.7% are aware of how long it should be taken, and 72.9% are aware of how to properly use the medications that have

been prescribed. When a patient fills a repeat prescription, counseling offers the chance to find out if the patient is properly administering the medication. If the medication is producing the desired results or if there are any negative side effects. It provides a another chance to find any mistakes.

No patient (%) ever hears their management give oral instructions on side effects, warnings, or precautions associated with medications. The patient should be told of a drug's normal side effects in order to decrease medication-related problems, however some patients could get perplexed or even concerned if a specific side effect is discussed. Only 11 percent of the 384 patients correctly indicated that they should keep the prescribed medications. The correct storage instructions are necessary for medical supplies that must be kept in particular conditions (Kumarianpress, 1997).

Patient counseling is the last step in making sure the right prescription is given to the right patient, especially if the patient is aware of the medication's name, its purpose, and how to take it. The patient who has this information is much better position to ask question during counseling by pharmacist and to help ensure that correct drug is given to them (RR, 1996).

According to the in-depth interview with the dispensers, the respondents listed a number of variables in the following order of their possible importance to effect the dispensing error rate: High patient flow rate or workload, legible handwriting, carelessness on the part of the dispenser, a subpar dispensing setting, interruptions during tablet or capsule counting, the storage of medications with similar names close to one another, and a lack of work flow systems, the most popular of which is SOP, are all factors that can affect patient safety. Half of the workers was exhausted while dispensing, but they were able to revive themselves by taking breaks, getting clean, and drinking coffee and tea. Given the limitations of the study, the conclusions should be applied. The main problem with the viewpoint research is the possibility of observer bias, which can affect staff performance and make it challenging for observers to spot errors. This study's drawback is that it primarily focuses on outpatient dispensaries and ignores inpatient dispensaries. Additionally, the observation mostly neglected other difficulties connected to the pharmacy setting and concentrated only on mistakes made during dispensing. Furthermore, as the study was limited to EPH, no generalizations could be made from its findings.

5. CONCLUSION

According to the report, patient identification, content, labeling, and counseling errors are the four most common types of mistakes made in primary hospitals in Shegar Oromiya, Ethiopia. Labeling and patient identification receive the highest percentages, but content error and counseling error receive the lowest percentages. These findings suggest that a major improvement is needed in the dispensing quality at the OD pharmacy at the primary hospitals in Shegar, Oromiya, Ethiopia.

notably in regards to errors made during patient identification and treatment. A high patient flow rate or workload, unreadable handwriting, carelessness on the part of the dispenser, a subpar dispensing setting, interruptions during pill or capsule counting, keeping medications with similar names close to one another, and a dearth of work flow procedures are all examples of factors that might affect how well medication is dispensed. Some of the criteria the pharmacist/druggist puts in order of importance that can have an impact on the dispensing error rate include SOP for the hospital pharmacy. Standard operating procedures (SOP) or EFDA-approved standards must be adhered to by a specific pharmacy while dispensing pharmaceuticals, as determined by the hospital's drug and therapeutic committee members.

The pharmacy department requires its own rules and regulations to reduce the pharmacist's carelessness throughout the dispensing process. Dispenser needs enough time to process each prescription document correctly. Clinical pharmacists should work with the other members of the healthcare team to create, carry out, and monitor a therapeutic plan in order to give each patient the best care possible. Pharmacists or dispensers must continuously assess the data on dispensing error and look for any potential workplace disturbances in order to develop risk reduction strategies to safeguard patient quality and safety (Hawiyabite). The pharmacist must make sure the patient and/or their caregiver have all the knowledge and drug information necessary to precisely measure and administer dosages prior to patient discharge. Strong management is required to reduce problems with patient flow, crowding in the dispensing area, and dispenser interruption by creating a comfortable environment for the patient. Hospital administrators should also keep the issue of drug dispensing top of mind. They should provide the required resources (such as STG books and training for pharmacists) and inform the public about mistakes made in drug distributing and strategies for increasing drug consumption.

Furthermore, research should concentrate on interventional studies that seek to enhance dispensing quality, future advancements, and the avoidance of dispensing errors.

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