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*Full Length Research Paper*

# Assessment of Medicines use in Eastern Ethiopian Hospital: A Cross Sectional Study

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**ABSTRACT**

**Introduction:** Drug use evaluation (DUE) is a system of ongoing, systematic criteria based evaluation of drug use that will help ensure that medicines are used appropriately at the individual patient level. Irrational drug use is numerous and complex involving the health system, prescriber, dispenser, patient and the community. Hence, this study was focused on assessing rational drug use using WHO core drug use indicators in Dilchoral Hospital (DH), Eastern Ethiopia.

**Methodology:** A cross sectional study design was used. Data collection formatwere developed according to WHO recommendation and validated to our context. The data was processed and analyzed using EX-Cell sheet as per WHO criteria for drug use evaluation as per standard treatment guideline of Ethiopia.

**Result:** Majority of prescriptions had patient sex (68.00%), age (65.66%), and card number (73.50%). Only small number of prescription had patient weight (1.00%), patient diagnosis (1.16%), and dispenser's signature. Among the total prescribed medicines, (37.50%) were antibiotics, (34.61%) were injections, and more than ninety percent of drugs were written by generic name and use the hospital drug list.

**Conclusion:** Generally according to WHO guideline recommendation, most of the prescribing indicators are lower than the standards. Hence the hospital DTC collaborated with the hospital administration and staff should address the gaps. Dilchora Hospital Drug and Therapeutic committee (DTC) should promote rational prescription and dispensing practice for improved health care service and putting policy and procedure for prescribing antibiotics.

**Keywords:** DUE, medicine, dilchora, cross sectional, Ethiopia.

## RATIONALE OF THE STUDY

Irrational use of drugs is seen as a major health problem these days. Furthermore, irrational drug use results in an excessive drug expenditure which is unnecessary (Teshome et al., 2007). Roughly WHO estimates that more than 50% of drugs are either

prescribed or used inappropriately by a patient and about one third of the world's population lack access to essential medicines. Developing countries like ours spend 30-40% of their total health budget on drugs which are either expensive or unnecessary. This would double their drug expenditure every four years (Awad et al., 2007).

Rational and scientific interventions to improve the drug management systems can only be carried out in the presence of appropriate and up to date information on the existing practices (Bashrahil, 2010). This inappropriate use has serious health and economic consequences for the success of national health care system (Alkot et al., 2011).

Globally, more than 50% of all medicines are prescribed, dispensed or sold inappropriately, while 50% of patients fail to take the prescribed drugs correctly (Mulugeta et al., 2011). Irrational over use of medicines can stimulate inappropriate patient demand and lead to reduced access and attendance rates due to medicine stock outs and loss of patient confidence in health (Bhartiy et al., 2008).

Generally, irrational drug use is numerous and complex involving the health system, prescriber, dispenser, patient and the community. Hence, this study was focused on assessing rational drug use using WHO core drug use indicators in Dilchoral Hospital (DH), Eastern Ethiopia.

## MATERIAL AND METHODS

### Study design, settings and participants

A retrospective cross sectional study design was used to evaluate the use and appropriateness of ceftriaxone in Dilchora Hospital, DireDawa Ethiopia from December 2017-January 2018. The Hospital provides comprehensive curative, preventive and rehabilitative service for around 1,000,000 people living in Dire Dawa & its surrounding community. Data extraction tool was developed using WHO tools.

### Sampling procedure

Systemic Random Sampling method was applied for selection of the prescriptions from the previous 12 months. According to the WHO recommendation, a minimum of six hundred (600) encounters was considered. For patient care assessment, sixty (60) patients who are volunteers were interviewed through systematic random sampling method. The data was extracted from prescription papers during hospitalization in Dilchora Hospital.

### Data collection procedures

Data were collected using structured and pretested questionnaires for prospective study and WHO designed criteria based data collection formats for retrospective study. The tool was tested by taking prescription papers and the pre tested prescription papers were excluded from the study. Each case from the prescription papers were evaluated against WHO standards. Supervised by the principal investigators, five diploma nurses collected the data. We gave a half day training for the data collectors. To ensure the quality of data, the principal investigator checked the data extraction tools and questionnaire for completeness and consistency daily.

### Statistical analysis

The data was processed and analyzed using EX-Cell sheet as per WHO criteria for drug use evaluation. Five WHO criteria namely Average number of drugs per encounter, Percentage of drugs prescribed by generic name, Percentage of encounters with an antibiotic prescribed, Percentage of encounters with an injection prescribed, Percentage of drugs prescribed from essential drugs list or formulary, Percentage of drugs with right dose, strength, duration of treatment and Percentage of prescription with complete information of Prescriber's name, signature, dispenser's name, dispenser's signature, Patient's name, address calculated.

### Ethical considerations

The ethical clearance was obtained from Dilchora Hospital Ethical Committee. Explanation of the purpose of the study stating the importance of participating in the study was given to the sixty participants. Participation in to the study was strictly on voluntary basis. Informants was also showed their consent by putting their signature voluntarily and return the questionnaires in a sealed collection box.

## RESULTS

### Completeness of the prescription

All prescription papers were standard (100.00%) and with patient name (99.00%). Majority of prescriptions had patient sex (68.00%), age (65.66%), and card number (73.50%). Only small number of prescription had patient weight (1.00%), patient diagnosis (1.16%), and dispenser's signature (12.33%) (Table 1and Figure 1).

**Table 1.** Quality of Prescription Completeness in outpatient pharmacy at Dilchora Hospital, East Hararge, Ethiopia, August 2016-July 2017, (*n*=600 encounters).

| Completeness of Prescription | Number | Percent (%) |
|---|---|---|
| Using standard Prescription | 600 | 100.00% |
| Prescription with date | 361 | 60.16% |
| Prescriptions with patient name | 594 | 99.00% |
| Prescriptions with patient sex | 408 | 68.00% |
| Prescriptions with patient Age | 394 | 65.66% |
| Prescriptions with patient weight | 6 | 1.00% |
| Prescriptions with patient card number | 441 | 73.50% |
| Prescription with diagnosis (ICD code) | 7 | 1.16% |
| Prescriptions with Address | 23 | 3.83% |
| Prescriptions with Prescriber's signature | 524 | 87.33% |
| Prescriptions with dispenser's signature | 74 | 12.33% |

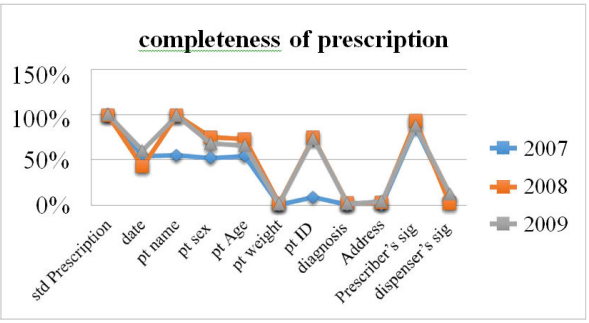


**Figure 1.** Completeness of prescription in the year 2007, 2008 and 2009.

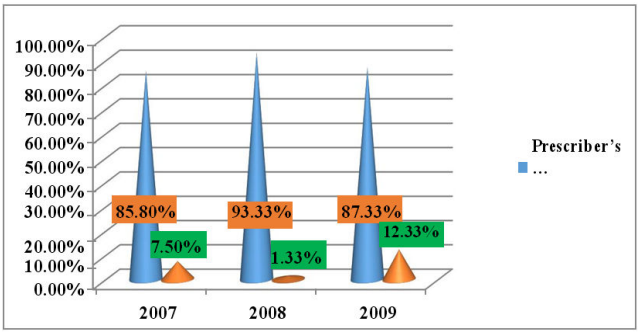


**Figure 2.** Percentages of Prescribers.

## Prescribing Indicators

Majority of prescriptions had correct route of administration (76.00%), dose (90.50%), frequency (81.66%) and quantity of drugs (73.83%). Among the indicators, less than half of the prescriptions had drug dosage form (42.66%) and duration of treatment (52.33%) (Table 2). Among the total prescribed medicines, (37.50%) were antibiotics, (34.61%) were injections, and more than ninety percent of drugs were written by generic name and use the hospital drug list (Table 3 and Figure 2).

**Table 2.** Quality of complete drug information prescribed in outpatient pharmacy at Dilchora Hospital, East Hararge, Ethiopia. From August 2016-July 2017, (*n*=600 encounters).

| Prescribing Indicators | Number | Percent (%) |
|---|---|---|
| Prescriptions with correct drug name | 600 | 100.00% |
| Prescriptions with correct drug strength | 559 | 93.16% |
| Prescriptions with correct drug dosage form | 256 | 42.66% |
| Prescriptions with correct Route | 456 | 76.00% |
| Prescriptions with correct Dose | 543 | 90.50% |
| Prescriptions with correct Frequency | 490 | 81.66% |
| Prescriptions with correct Quantity | 443 | 73.83% |
| Prescriptions with correct Duration | 314 | 52.33% |

**Table 3.** Characteristics of prescribing medicine in outpatient pharmacy at Dilchora Hospital, East Hararge, Ethiopia. From August 2016-July 2017, (*n*=600 encounters).

| Prescribed Medicines | Number | Percent (%) |
|---|---|---|
| Number of drugs prescribed | 1144 | - |
| Number of antibiotics prescribed | 429 | 37.50% |
| Number of drugs prescribed by generic name | 1005 | 87.84% |
| Number of injections prescribed | 396 | 34.61% |
| Number of drugs prescribed from health facility's drug list | 1114 | 97.38% |

**Table 4.** Characteristics of prescribing medicine in outpatient pharmacy at Dilchora Hospital, East Hararge, Ethiopia, From August 2016-July 2017, (*n*=600 encounters).

| Characteristics | Percentage | Standard |
|---|---|---|
| Percentage of Prescription with antibiotics | 71.50% | 20–30% |
| Percentage of Prescription with injections | 66.00% | (13.4-24.1)% |
| Percentage of drugs prescribed by generic name | 87.84% | 100% |
| Percentage of antibiotics Prescribed | 37.50% | - |
| Percentage of injections Prescribed | 34.61% | - |
| Percentage of drugs prescribed from health facility's drug list | 100.00% | - |

| | | |
|---|---|---|
| Average number of drugs per prescription | 1.9 | 1.60–1.80 |

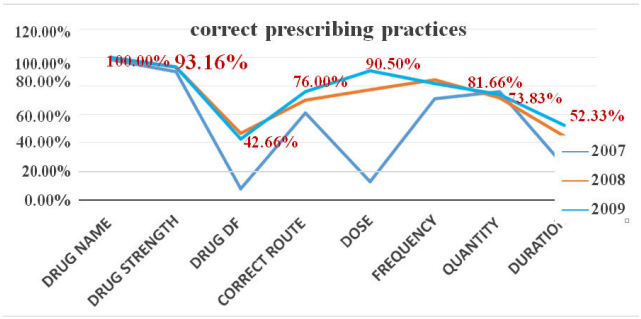


**Figure 3.** Image showing correct practices of prescribing.

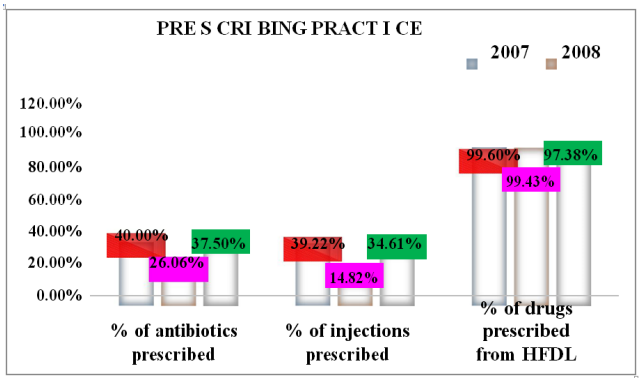


**Figure 4.** Prescribing practices in year 2007 and 2008.

**Table 5.** Quality of labelling of drugs dispensed in Dilchora Hospital, East Hararge, Ethiopia. From March 2017 - April 2017, (*n*=60 encounters).

| Labeling Information | Number | Percent (%) |
|---|---|---|
| Labeling material with Patient name | 0 | 0% |
| Labeling material with Drug name | 54 | 90.00% |
| Labeling material with strength | 21 | 35.00% |
| Labeling material with dose | 13 | 21.66% |
| Labeling material with Frequency | 17 | 28.33% |
| Labeling material with Quantity | 19 | 31.33% |
| Labeling material with direction for use | 7 | 11.66% |
| Labeling material with date of dispensing | 0 | 0% |
| Labeling material with Dispenser's address | 0 | 0% |
| Labeling material with Precaution | 0 | 0% |

**Table 6.** Patient knowledge on dispensed drugs at Dilchora Hospital, East Hararge, Ethiopia. From March 2017-April 2017, (*n*=60 encounters)

| Patient knowledge | Number | Percent (%) |
|---|---|---|
| Patients who know indication of the prescribed medicines | 55 | 91.66% |
| Patients who know the name of the prescribed medicines | 8 | 13.33% |
| Patients who know the dose of the prescribed medicines | 24 | 40.00% |
| Patients who know the frequency of the prescribed medicines | 54 | 90.00% |
| Patients who know the duration of the prescribed medicines | 45 | 75.00% |
| Patients who know the correct storage condition of the prescribed medicines | 24 | 40.00% |
| Patients who know precaution for the prescribed medicines | 5 | 8.33% |

**Table 7.** Number of actually dispensed drugs among prescribed at Dilchora Hospital, East Hararge, Ethiopia. From March 2017-April 2017, (*n*=60 encounters).

| Prescribed Medicines | Number | Percent (%) |
|---|---|---|
| Number of drug prescribed | 137 | - |
| Number of drugs actually dispensed | 117 | 85.40% |
| Patients satisfied with information/service provided by the dispenser | 50 | 83.33% |

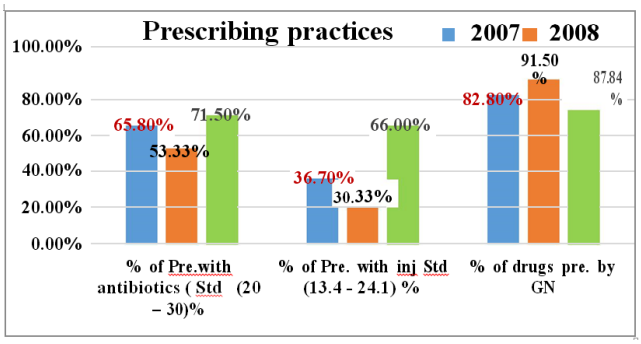


**Figure 5.** Prescribing practices in the year 2007 and 2008.

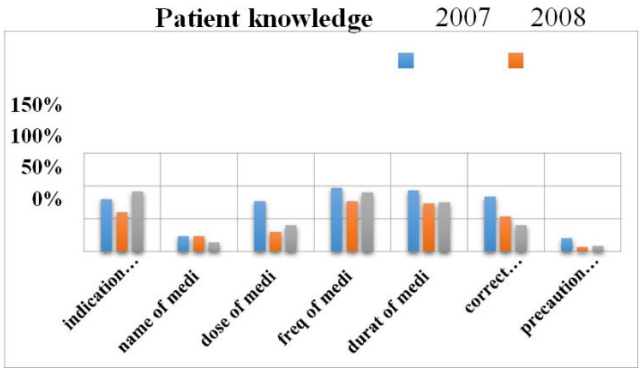


**Figure 6.** Patient knowledge on prescription in year 2007 and 2008.

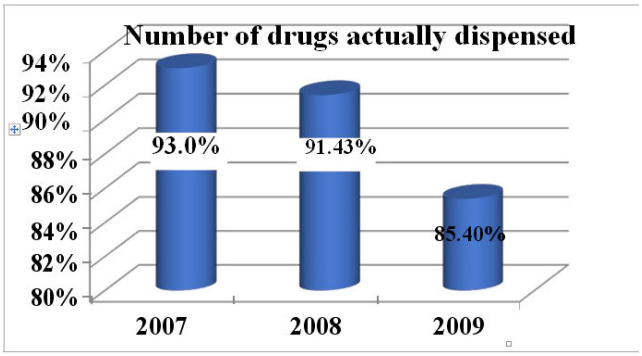


**Figure 7.** Number of drugs dispensed in the year 2007, 2008 and 2009.

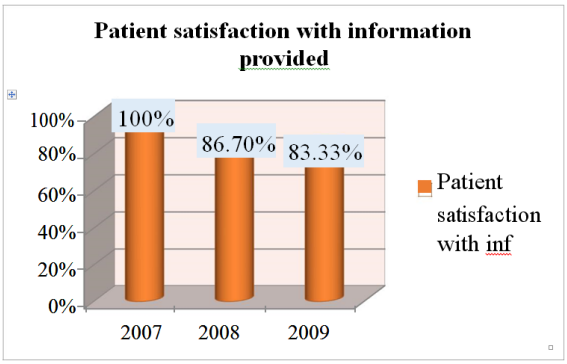


**Figure 8.** Patient satisfaction in the year 2007, 2008 and 2009.

## DISCUSSION

According to this study patient identification like patient sex, age, address, card number and date of diagnosis was filled only (68.0%), (65.66%), (3.83%), and (73.50%) respectively Which is lower than a study conducted in Adama Hospital, which had 449 (74.83%), 437 (72.83%), 15 (2.5%), 255 (42.5%) and 447 (74.5%) prescriptions were contain patients sex, age, address, date and card number respectively (WHO, 2002) (Table 4). This might be due to lower commitment and awareness of the staff (Figures 3 and 4).

In this study the list scores were prescription having patient weight (1.0%), diagnosis (1.16%) and dispenser's signature (12.33%) (Table 5). Although there is emerging of medico legal issue it is very low than expected, which showed very reluctant concerning prescription evaluation.

In addition, the study 71.50% of prescription contains at least one antibiotic. This value is lower compared to the study done in Eastern Ethiopia (82.5%) (Gelaw et al., 2015) but, this is very far from the national standards (20-30%). In addition, the percentage of prescription with an injection encounter was (66.0%) which is far higher than the standard (13.4–24.1%) and a study done in Dessie Referral Hospital (42.0%) and Eastern Ethiopia (11.2%) (Gelaw et al., 2015 and Hawi et al., 2012) (Table 6). This might be because of DRH is a referral hospital and so many patients are critical who needs injectable medications (Figures 5 and 6).

Generally according to WHO guideline recommendation, most of the prescribing indicators are lower than the standards; this might be due to lack of training the new staffs, lack of practicing reminding systems, lack of experience of prescribers toward writing the correct prescribing practices and finally practicing of good welcoming of unfilled prescription to the dispensaries (Figures 7 and 8).

When we conclude our study, patient diagnosis and weight are important patient information, were nearly absent. Majority of the prescribers paid less attention to write drug dosage form, route, quantity and duration of treatment. The prescribing practices of antibiotic and injection showed still far deviation from the standard recommendation by World Health Organization (Tables 7 and 8). Patient knowledge about prescribed medicines including dose, name of the drug, and duration of treatment were poor. Majority of patients were aware of drug indication, frequency and duration of treatment. Availability of drugs, generic prescribing, patient satisfaction on pharmacy service and prescribing drugs from facility specific drug list are among good findings from the assessment (Berhanu et al., 2014).

Hence the hospital DTC collaborated with the hospital administration and staff should address the gaps. Dilchora Hospital Drug and Therapeutic committee (DTC) should promote rational prescription and dispensing practice for improved health care service and putting policy and procedure for prescribing antibiotics. The committee should act in full effort for reducing overuse of injections in the facility. Health education should be strengthened in systematic and peculiar way in different programs in integration with stakeholders. Qualitative studies are necessary in order to evaluate the different factors involved and to plan future interventions.

Further research should be done nationally to explore rational use of drugs in Ethiopia.

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All authors involved in designing of the study, data collection, data analysis, drafting and critically

reviewing the manuscript. All authors read and approved the final manuscript.

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