



## QI Project to Reduce Non-Leftover Medication Wastage in Haramaya University Hiwot Fana Comprehensive Specialized Hospital Pediatrics Ward, Harar, Ethiopia

Tilahun Tadesse<sup>1\*</sup>, Abdi Amin<sup>2</sup>, Bisrat Hagose<sup>3</sup>, Eyoel Abebe<sup>4</sup>, Melaku Teshome<sup>5</sup>, Samson Hailu<sup>6</sup>, Muluken Getu<sup>7</sup>, Aduga Mulugeta<sup>8</sup> and Yohannes Molla<sup>9</sup> and Abdulbasit Ahmed<sup>10</sup>

Haramaya University

**Corresponding Author:** Tilahun Tadesse [glorytojesus.2245@gmail.com](mailto:glorytojesus.2245@gmail.com)

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### ABSTRACT

Non-leftover medication wastage refers to medications dispensed out but not used by patients as they are not in the treatment regimen. This project aims to reduce non-leftover medication wastage in Haramaya University - Hiwot Fana Comprehensive Specialized Hospital (HrU-HFCSH) pediatric ward, Harar, Ethiopia. Baseline assessment showed that, 23 % Of medications dispensed from single dispensary were not administered to the patient as they were not in the treatment regimen. This implies that, 29 % of cost of medications dispensed from a single dispensary were wasted. Before-and-after study was conducted. All data were converted into monetary value and presented as % wastage and % discrepancy. Medications which are dispensed but not used by the patient were considered as wasted if they were not in the treatment regimen. Monitoring of discrepancy in medication supply and administration data. Overall there were 24.65 % reduction in % wastage (financial), 18.65 % reduction in % wastage (product) and 15 % reduction in % discrepancy from the baseline. The findings of this project indicate the importance of monitoring discrepancies in medication supply and administration data in reducing non-leftover medication wastage.

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## **INTRODUCTION**

Medication wastage refers to any pharmaceutical product that remains unused or not fully consumed throughout the pharmaceutical supply and use chain. It's an act or instance of using or expending medications carelessly, extravagantly, inefficiently, ineffectively or to no purpose". It can be classified as Leftovers and non-leftover wastage. Leftover wastage refers to medicines dispensed to patients and remained unused due to several patient, condition or drug related factors, whereas Non-leftovers Medication wastage are those dispensed out but not used by patients as they are not in the treatment regimen. Budget constraints in financing the health care system together with huge amount of wastage costs create a serious risk to the patient and health care system. In Ethiopia, none of previous studies aimed to assess non-leftover wastage. This project aims to reduce non-leftover medication wastage in pediatric ward of Haramaya University Hiwot- Fana Comprehensive Specialized Hospital (HrU-HFCSH), Starting from February 2023 to July 2023, Harar, Eastern Ethiopia.

It is true that the Hospital cannot accurately account for all medications. But at least there must a way to identify discrepancy between medications supplied and medications administered to various patient. But in our institution, there was no safeguards to fully account for drug losses and no way to identify discrepancy in medication use process. Due to these and additional factors, Medication wastage, theft and financial discrepancy have shown to be high. Baseline assessment of randomly selected prescription and their corresponding patient chart showed that, 23 % Of medications dispensed from pediatrics pharmacy were not administered to the patient as they were not in the treatment regimen. This implies that, in terms of money 29 % of cost of medications dispensed from a single dispensary was wasted. In addition to this, baseline % discrepancy in the dispensary was conducted, data from 1 month reference period were taken, accordingly, there was 19 % discrepancy between medication issued to the dispensary and medications supplied to various patients and units.

The facility estimates and purchase pharmaceuticals by calculating past consumption, but this estimation does not account for wasted and undocumented medications that will compromise accuracy of estimation and leads to stockout of essential medicines before the next purchase period is reaching, so the problem is not only limited to the facility, patients are also pressured to buy pharmaceuticals from private pharmacy at high cost due to medication wastage and associated stock out of essential medicines in the facility. This project aimed to reduce non-leftover wastage and associated stock out of essential medicines in HFCSH pediatric ward.

## **METHODOLOGY**

Before-and-after study which utilize data collected through both prospective and retrospective methods were conducted. Brain storming, System thinking, Technical expert opinion and Fish bone diagram was used to organize and analyze the root cause of the problem. Driver diagram was used to guide our intervention. 3 key areas which are vulnerable for wastage and theft were evaluated. All data were converted into monetary value and presented as % wastage and % discrepancy. Medications which are dispensed but not administered to the patient were considered as wasted medications if they were not part of the treatment regimen.

## **RESEARCH RESULT**

Three main interventions evaluated in this project were:

### **1) Implementation of new prescribing and dispensing protocol**

The purpose of this protocol was to assure that medications are reaching to the right patient and to those who needs it the most, to avoid dispensing medications more than its daily requirement and to provide an easy way to identify weather the required medications are already dispensed or not. In this prescribing and dispensing protocol, List of all current medications that the patient is taking and maximum daily amount to be dispensed for each medication calculated and documented by HCP available at ward. The pharmacy personnel at dispensing unit check documentation of the patient's current medication on this chart, record amount of medication dispensed with each encounter and make sure that maximum daily amount to be dispensed is not exceeded. Medications which are not documented on this chart will not be dispensed to the patient at the dispensary.

### **2) Monthly financial audit of discrepancy**

Discrepancy between cost of stock available for sale during specified 1 month period and documented cost of stocks dispensed to various patients, issued to other units, expired / damaged stock in dispensary were audited. The finding from the auditing process were informed to pharmacists working in the dispensary. They were given orientation to make them aware of their poor documentation and associated high discrepancy. Roles and responsibilities were assigned for the dispensing staff. They were encouraged to work in responsible manner and informed on direct and indirect consequence of their negligence on both institution and patient/community. Discrepancy between cost of stock from calculated ending balance and Cost of stock from physical inventory were calculated as total discrepancy in monetary value and presented as % discrepancy after adjusting for inventory accuracy rate.

### 3) Control of stocks flow in the dispensary

The aim of this intervention was to create accountability and transparency of stock flow in the dispensary. List of all medications which are stocked in the dispensary were provided in alphabetical order. Pharmacists at dispensing unit were assigned responsibility. Some of them to record amount of medication dispensed after each transaction and others to provide dispensing and counseling service. The one who dispense products does not involve in documentation of transaction. Weekly consumptions of medications supplied from the dispensary were calculated and documented. The information obtained from this register will be used to compare weekly consumption of each medication with amount at hand when updating bin card every week.

8 data points were taken in 4 PDSA cycles. In the final (4th) PDSA cycle significant improvement has been shown in all of outcome measures. Over all, from the baseline there was; 24.65 % reduction in % wastage in terms of financial, 18.65 % reduction in % wastage in terms of product and 15 % reduction in % discrepancy from financial auditing of dispensary.

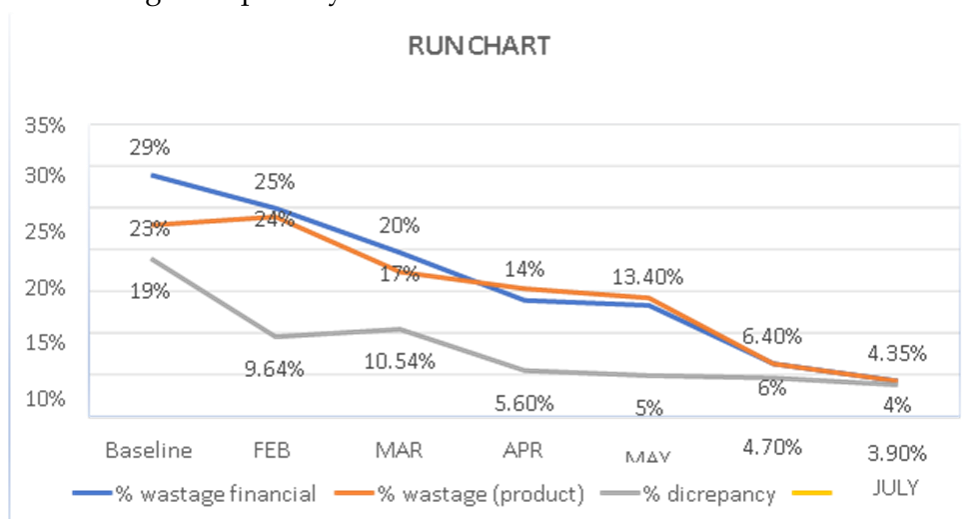


Figure 1. Reduction 4 PDSA cycles

## DISCUSSION

Our study evaluated non-leftover medication wastage by identifying discrepancy in medication supply and administration data at pediatric ward of HrU-HFCSH. For the ease of comparison with other studies, non-leftover medication wastage was evaluated in terms of both financial and product. Medication wastage due to expiry or damage and leftovers were not included in this study. Most of previous studies were conducted in a setting where there is electronic medication record (EMR) system is in place (Al-azzam et al., 2012, Kagashe et al, 2014), whereas our study was conducted in setting of no EMR.

Baseline assessment on randomly selected prescriptions and their corresponding patient chart showed that, the rate of non-leftover wastage was 29% in monetary value and 23% in terms of product. This means that, 23 % of

the dispensed medications from pediatrics pharmacy were not administered to patients, as they were not in the patient's treatment regimen. This finding is higher than 14% non-leftover rate reported in study conducted at internal medicine department of a tertiary referral hospital in Tanzania (Kagashe et al, 2014) and 15 % discrepancies between dispensed versus administered medications (Vigoda et al, 2007). This difference in non-leftover wastage may be due to difference in the setting of our study. Both of previous studies (Kagashe et al, 2014) and (Vigoda et al, 2007) were conducted in a setting that utilize electronic databases to monitor discrepancy between medication supply and administration data, whereas, our study was conducted in pediatric ward where there is no EMR system available in place. Unavailability of EMR and safeguard to fully account for drug lose can crates an environment that favors uncontrolled and unlimited prescribing and dispensing process, that can significantly increase discrepancy in medication supply and administration data. In addition to this, in our setting, all of the patients' medication fee was covered by a third party. These can also encourage prescribers to order without fearing cost of medication imposed on the patient. Patients (attendants) are also less likely to ask why medications are prescribed, because, there is no direct out of pocket money that patients (attendants) pay for medications. These factors can contribute for high non-leftover wastage which was observed in our baseline assessment.

19% discrepancy between medication issued to the pediatric ward dispensary and medications dispensed from this dispensary to various patients were observed in our baseline assessment. In another study conducted to assess electronic medication supply and usage data for twenty frequently used medications in four Melbourne hospitals disclosed that, discrepancy was observed in 19.2 % of units supplied to medical, surgical wards and emergency department (Walker et al, 2021). Although these findings are comparable, there was a quite difference in the settings of the studies. Our study was conducted in a single ward of comprehensive university hospital and all of medications supplied to the dispensary and medications dispensed to various patients were evaluated, whereas, in the previous study, discrepancy was evaluated in multiple facilities and wards by selecting some of commonly used medications. Unavailability of EMR in our study setting is also another factor that need to be considered. Due to these and additional factors, comparing of our study with previous one is difficult.

After baseline assessment, to plan for additional interventions, we tried to investigate possible reasons that contributes for high non-leftover wastage and high discrepancy rate. So, based on observation and response obtained from health care professionals (HCP) working in the area, Prescribing

medication in the name of those who have insurance coverage in an attempt of helping those who do not have insurance coverage or who are unable afford prescribed medication were the one and only reason mentioned by prescribers working in this ward. In contrast to reasons reported from prescribers, diverse response was obtained from dispensers working in the pediatrics dispensary. Some of reasons that contributed for high discrepancy rate between medications issued to the dispensary and medications dispensed from this dispensary to various patients includes; forgetfulness to document due to high work load, forgetting to document verbal orders, failure to document damaged or expired medication as they are removed from the shelf and low inventory accuracy were the most common reasons that have made contribution according to response obtained from dispensers working in the area. These reasons are quite different from studies that reported theft, typically for self-treatment in or outside the workplace (Al-azzam *et al.*, 2012 and Dabney, 1995) and diversion of controlled medications (Vigodaet al, 2007, Hughes, 2007) as contributors of high discrepancies. As opposed to these, discrepancy in supply and administration data of controlled substance were not observed in our study. A strict laws and regulation against the use of controlled substance in Ethiopia and also strong attitude against the use of narcotics in our community may be attributed for reduced incident of diversion of controlled substance by HCP in our study.

## **CONCLUSIONS AND RECOMMENDATIONS**

Our finding indicates that; strict monitoring and control of discrepancy in medication supply and administration data was effective in reducing non-leftover medication wastage at pediatric ward of HrU-HFCSH. Based on the finding from our project, it is recommended for HrU- HFCSH to conduct regular and random audits of discrepancy in the medication use process and apply the concept of this project in all other wards. It is also recommended for Harari RHB and for FMOH to test the concept of this project in other public health facilities found in the region and the country, where there is no EMR system in place to fully account for drug lose.

## **ADVANCED RESEARCH**

Our study was carried out in selected ward of a single hospital, so, the findings may not be typical of other institutions. In order to make generalization based on the findings, it should be evaluated in large multicenter studies. In addition to this, leftover medication wastages which are also the main contributors on wastage in health care system were not evaluated in our study. Additional studies are required to address these issues

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