



ADDIS ABABA UNIVERSITY

SCHOOL OF COMMERCE

**DEPARTMENT OF ART OF LOGISTICS AND SUPPLY CHAIN
MANAGEMENT**

**ASSESSMENT ON AUDITABLE PHARMACEUTICAL
TRANSACTION AND SERVICE IMPLEMENTATION
OUTCOMES ON PHARMACEUTICAL SERVICES: THE
CASE OF TIKUR ANBESSA SPECIALIZED HOSPITAL.**

BY: TAKELE TESSEMA

AUGUST, 2021

ADDIS ABABA, ETHIOPIA

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SERVICES: THE CASE OF TIKUR ANBESSA SPECIALIZED HOSPITAL.**

**A THESIS SUBMITTED TO ADDISABABA UNIVERSITY, SCHOOL OF
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DECLARATION

I, the undersigned, hereby certify that this thesis is my own work, written under the supervision of Dr. Matiwos Ensermu. All sources of resources utilized in the thesis have been properly credited. I further affirm that the thesis has not been submitted, in whole or in part, to any other higher learning institution for the intention of receiving a degree.

NAME _____

SIGNATUR _____

ENDORSEMENT

This thesis has been submitted for examination to Addis Ababa University's School of Commerce Graduate Studies, with my permission as a university adviser.

Advisor _____ Signature & Date _____

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LIST OF ABBREVIATIONS /ACRONYMS

APTS	Auditable Pharmaceutical Transaction and Services
DTC	Drug and Therapeutics Committee
EC	Ethiopian calendar
EHRIG	Ethiopian Hospital Reform Implementation Guideline
ETB	Ethiopian Birr
EPSA	Ethiopia Pharmaceutical Supply Agency
MOH	Ministry of Health
IPLS	Integrated Pharmaceutical Logistics System
HSDP	Health Sector Development Program
MSD	Medical Services Directorate
OPD	outpatient department
PFSA	Pharmaceutical Fund and Supply Agency
RDF	Revolving Drug Fund
SIAPS	Systems for Improved Access to Pharmaceuticals and Services
SNNPR	Southern Nations, Nationalities and People's Region
SPS	Strengthening Pharmaceutical Systems
SPSS	Statistical Package For Social Science
SSA	Stock Status Analysis
TASH	Tikur Anbessa Specialized Hospital
USAID	US Agency for International Development
VEN	Vital, Essential, Nonessential
WHO	World Health Organization

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ABSTRACT

The Auditable pharmaceutical transaction and service (APTS) system is a set of data-driven interventions to establish responsible, transparent, and accountable pharmacy practice. It also optimizes utilization of medicine budget, improves access to medicine, workflow, generates reliable information for decision making, and improves patient satisfaction. Pharmaceutical transactions and facilities were particularly vulnerable to mismanagement due to a lack of transparency and accountability due to a lack of transparency and accountability, which resulted in poor planning, decision-making, prescribing and dispensing, and reporting, risking both the availability and usage of medicines. The objective of this study is to assess the outcomes of APTS implementation using the five APTS result areas in Tikur Anbessa Specialized Hospital. A facility based cross-sectional descriptive study design was employed by using a structured questionnaire on pharmacy professionals and patients who received pharmacy service at TASH. Key informant interviews were conducted with the hospital's pharmacy director, finance director, and internal auditor, and direct observation of the availability of medications was also used. A systematic random sampling technique was maintained to recruit the study population. Descriptive statistics were computed using the statistical package for social sciences version 22. The vast majority of pharmacists (68.5%, 72.6%, and 90.4%) believe that APTS provides employment opportunities for pharmacists, and improves the transparency of drug transactions and pharmacy record keeping practices respectively. 65.8% of them agreed that APTS is vital to improving pharmacy services. But, 56.1% of them were dissatisfied with their jobs.

Increased workload, attrition rates among pharmaceutical professionals, and delays in creating an indemnity policy and the lack of a performance management and reward system were the major challenges. Medicine availability is 63.3% at stores and 55% at dispensaries. The findings were not comparable to the APTS-implemented public hospitals in Gamo Gofa where 85 percent of patients were enrolled. [Carmichael JM et al, 2017], Dessie referral hospital (84%) [Kasahun Bogale .., et al 2021], and Amanueal mental hospital (84%) [Alemayehu Y, et al, 2017] of the patients reported that prescribed drugs were available. 65.5% of patients were dissatisfied with the availability of certain drugs. The labeling information is lower than the WHO recommendation (100%). More than half of pharmacists and 34.5% of patients said auditable pharmaceutical transactions and services satisfied them. Several obstacles hampered the pharmacy service's smooth adoption. To improve pharmaceutical service, it is recommended that workload be determined, indemnity and other incentive mechanisms be implemented, management ownership be taken on, and follow up be done.

1. INTRODUCTION

1.1 Background of the Study

Health is a basic human right and achieving the highest possible standard of health is one of the most global social goals [EHRC, 2012]. Patients do not go to health facilities where there is no medicine; hence the pharmacy package is recognized as the health-care program's foundation. Thus, the availability of medications and pharmaceutical personnel are thus critical for the service's proper operation. [Anderson, 2002]. Ensuring equitable access to quality medicines guaranteed their appropriate use is an essential function of the health system. However, most health systems struggle to access and use drugs appropriately and cost-effectively. Access refers to affordability, acceptability, and accessibility [Begdeli et al, 2013] and without essential drugs, health systems cannot really help people who fall sick, live with chronic illness and go through different stages of life until death. Without a strong health system, people cannot realize their right to health. Essential drugs are essential to promote health and ensure sustainable development. The Sustainable Development Goals adopted in September 2015 by UN Member States recognize that equitable access to affordable essential medicines of guaranteed quality is a crucial step in achieving these key objectives [UN, 2015]. The delivery of important drugs has been solitary of the eight elementary components of prime wellbeing repair, according to the World Health Organization. Kar SSI (2010) stated that the availability of required medicines is critical to modern health care; everyone has a fundamental right to these drugs. [Kar SSI et al, 2010].

A pharmaceutical system includes all structures, people, process resources, and their interactions within the larger system that aim to ensure equitable and timely access to products quality-assured, safe, effective pharmaceuticals and related services that promote appropriate and cost-effective use to improve health outcomes[Hafner T,2016]. Most LMIC spending is not profitable because almost half of all drugs are prescribed, dispensed, or sold inappropriately and patients do not follow directions for about 50% of the medications they receive [Leisinger KM,2012]. More than half of the state's lack fundamental rules to promote drug usage. It's particularly high in underdeveloped countries, where just around 40% of public-sector patients and 30% of private-sector patients are preserved in accordance with the rules. [Ayalew A et al, 2012].

The basic aspects to complete to deliver pharmaceutical services quality and adequate patient satisfaction are the pharmaceutical organization of healthcare establishments, the movement of within pharmacies, the quantity, composition, and pharmacist/client ratio. [Kathleen H et al, 2011]. Pharmacies in hospitals are organized on an outpatient basis; a licensed pharmacist oversees dispensaries and a main medicinal warehouse. [FMOH, 2010]. In additionally, the hospital must have the necessary staff, apparatus, buildings, and facilities to keep goods and manners, as well as delivery and advice.

Good Pharmacy Practice describes the dispensing procedure to be followed by pharmacists and divides this process into three phases: interpreting and evaluating the prescription, preparing and labeling the prescribed medicine and providing information and

instructions to the patient to ensure the safe and effective use of the medicine [LU Y et al, 2011].

Pharmaceutical expenditure accounts for 25 to 67% expenditure on health in low-income nations and Pharmaceutical services in Ethiopia have remained inadequate, accounting for 70% of the country's health expenditure [PFSA, 2017].

Ethiopia has implemented several measures, responding to the difficulties of its faulty pharmaceutical management system , in the past to put in place a strong pharmaceutical and medical system, such as the creation of the Pharmaceuticals and Supply Agency as well as the introduction of systems, tools, and guidelines for implementing Ethiopian hospital reform, such as the logistics system integrated pharmaceutical, logistics and information management system, verifiable transactions and pharmaceuticals, and guidelines. Among these measures, we note an increase in expenditure of - including the budget for drugs - as well as an increase in the risk pool linked to the financing of drugs.

FMOH (2010) the EHRIGs mainly focused on hospital governance, quality of services, patient flow, record keeping, pharmaceutical services, and human resource management. The Pharmacy section of the EHRIG has been designed for the provision of quality pharmaceutical services and to establish transparency of pharmaceutical transactions in hospitals. The auditable pharmaceuticals service and transaction system is one of a kind in terms of its approach to system strengthening. It is a combination of data-driven actions aimed at establishing responsible, transparent, and accountable pharmacy practice. The APTS is projected to increase pharmaceutical service efficiency in five critical areas:

effective budget management, transparent and responsible transactions, trustworthy data, effective burden analysis, performance evaluation, and personnel deployment, and increased customer satisfaction [Kathleen H et al, 2011].

The system, APTS, was implemented at the level in Amhara in 2011 [CANRSE, 2012], Dire Dawa in 2012 [CDDA, 2012], SNNP in 2014 [CSNNP, 2014], Tigray and Oromia in 2015 by the federal government in 2014 [Dr.Kesete Berhan, 2014]. FMOH of Ethiopia decided to scale up APTS nationwide.

Many factors, according to the APTS system, influence the quality and volume of service delivery, including a lack of in-house training, which manifests as a lack of knowledge and capability, chaotic flow, and inadequate infrastructure, equipment, and facilities to provide the service, lack of use of the most efficient service, drugs, and the number of professionals.

This study aimed to assess the performance of verifiable pharmaceutical transactions and services in Tikur Anbessa Specialized Hospital.

1.2 Statement of the problem

WHO (2018) described "access to medicine" as a multidimensional problem. Medicine shortages have hampered the successful delivery of high-quality healthcare services in many countries, including Ethiopia.

Therapeutic businesses and facilities were particularly weak to maladministration due to a lack of openness and accountability, which led to inadequate planning, decision-making,

prescribing and dispensing, and reporting. Together the accessibility and usage of drugs were endangered. The accessibility; acceptability, cost, and consistency of necessary pharmaceuticals remain used to gauge a health facility's willingness to deliver healthcare services. [EAHP, 2018]. According to a 2003 evaluation of Ethiopia's pharmaceutical industry, the total length of critical medication stock-outs in public health facilities and regional drug stores was 99.2 days. According to reports, up to 8% of drugs in hospitals are outdated. [Gedif T et al, 2016]

Efficient budget utilization is ensured by minimizing wastage of medicines. SIAPS (2015) reported that in most facilities, in Ethiopia, drug loss due to expiration has dropped from 8.24 percent to less than 2%.

Ethiopia's APTS system was introduced in. The VEN classification system was used by hospitals to ensure that the drugs acquired were acceptable for the hospital's target population's healthcare needs. More than 96% of commodities purchased were on the hospitals' medical lists, according to 3 Tigray area hospitals. [Hailu T, Ejigu E, Geremew E, and Adinew A, 2014].

The pharmacy workforce is critical to the pharmaceutical service's success. (WHO, 2015). To preserve pharmaceutical materials and carry out mixing, issuing drugs to patients, and counselling actions, the hospital must have sufficient employees, equipment, premises, and facilities. Clients should go in via one drugstore outlet and depart through the other, as the work flow should be structured. In this way, inside the pharmacy, customers can observe

the prescription evaluator, biller, cashier, and medicine use counselor in a queue 8 [Gedif T et al, 2016].

Client satisfaction with pharmacist services is an important metric for assessing the quality of pharmacy services provided to customers and the implementation of pharmaceutical care in hospitals. [Ahmed.A et al, 2016]. Satisfied customers with their pharmaceutical care are much more prone to take prescribed medications exactly as recommended. And they're less inclined to switch from one health care provider to another. [WHO, 2018]. 43 % of medicines given to patients in hospitals were mislabeled, and thirty three % of those who got them didn't know how to make advantage of them properly. And, according to data on the outpatient pharmacy service, TASH is the only tertiary hospital that treats more than 820 people each day. The vast majority of these patients will be given a prescription for one or more medicines. A cancer treatment center at the hospital welcomes patients from all across the country.

Shortages of vital drugs and pharmaceuticals, low patient satisfaction, and the quality of pharmacy services at the hospital all contribute to the hospital's failure to attain the necessary level of quality of health services expected of patients. To overcome these issues, the hospital has implemented an auditable pharmaceutical transaction and service since 2015.

Therefore, assess the system's implementation to make further improvements in areas where real. This article aimed to assess the results of the implementation of APTS in Tikur Anbessa specialized hospital.

1.3 Research Question

1. What are the results of TASH's APTS implementation in terms of availability and duration of stock-outs for key medicines?
2. What are the results of APTS implementation in TASH in pharmacy management and staffing?
3. What are the outcomes of APTS implementation in TASH in financing, budgeting, and auditing in pharmaceutical services?
4. What are the results of TASH's APTS implementation in terms of pharmaceutical service quality?
5. What are the results of TASH's application of APTS in terms of patient satisfaction with pharmaceutical services??
6. What are the primary issues that have hampered TASH's implementation of APTS?

1.4 Objective of the Study

1.4.1 General Objective

This study assessed on auditable pharmaceutical transaction and service implementation outcomes on pharmaceutical services in Tikur Anbessa Specialized Hospital.

1.4.2 Specific Objectives

1. To assess the outcomes of APTS implementation on stock out duration and availability of key medicines for medical stores in TASH

2. To assess the results of APTS application in Pharmacy Managing and Staffing
3. To assess the results of APTS application in financing, budgeting, and auditing in pharmaceutical services
4. To assess the outcomes of APTS implementation on the quality of Pharmacy services
5. To evaluate the impact of APTS on patient satisfaction in pharmaceutical services.
6. To determine the primary obstacles those have hampered the successful implementation of APTS.

1.5 Significance of the Study

1.5.1 TASH's Benefit

During the implementation of APTS in TASH, the research is required to identify the gaps between current practices and ideal practices. As a result, the study's findings may be useful. Proposals for enhancing the hospital's pharmaceutical governance by making further improvements in areas where there are shortcomings and strengthening parts where the system excels.

1.5.2 For social change

This research might help to bring about social change by aiding medical organizations in guaranteeing that vital medications are accessible to customers whenever they need them.

1.5.3 Advantage for others

The insights will also help future researchers have a decent understanding of the issue and will give tips for them.

1.6 The study's scope

1.6.1 Regional Scope

The research is limited to Tikur Anbessa Specialized Hospital in Addis Ababa, which is located in the Lideta sub-city of Addis Ababa, near the main post office/immigration office, among the several hospitals in the region.

1.6.2 The scope of the concept

The goal of this study was to analyze the APTS implementation outcome in TASH in order to generate data that helps to improve pharmaceutical governance at the hospital. Even though hospital management is a wide topic, this study focused on pharmaceutical management.

1.6.3 The Scope of the Method

The data collection techniques observations, interviews with the pharmacy director, finance director, and internal auditor, as well as questionnaires to clients and pharmacy staff were used in the study. The study used a data analysis with a combination of methods (both qualitative and quantitative types).

1.6.4 Duration of the study (Time Period scope)

The research was carried out between January 15, 2021, and April 2, 2021.

1.7 The Study's Organization

The paper is divided into five sections. The study's history, problem statement, aims, scope, significance, and other pertinent details are all included in the first chapter. The literature review, both theoretical and empirical, is presented in the second chapter to support the investigation. In the third chapter of the study, the research design and methodology are described. The results and discussion are presented in the fourth chapter. The study's primary findings, conclusions, and suggestions are summarized in the last chapter.

1.8 Limitation of the study

-Despite the fact that optimum budget use includes both waste rate and pharmaceutical affordability, this study focused solely on wastage rate.

-The study's cross-sectional design made it impossible to determine a temporal association. Because respondents were asked to reply based on their own experiences, social desirability bias could alter the study's conclusions.

1.9 Operational Definitions

Knowledge of experts: When asked to describe their allocated jobs in relation to APTS implementation, the participants in the research (pharmacists, cashiers, and accountants) had a 100 percent level of understanding.

Customer knowledge: If patients respond yes to at minimum all five fundamental WHO drug use indicators (dose, method of administration, frequency, duration, and storage) during the exit interview, they are deemed to know how to take their dispensed medications.

Customer Satisfaction: patients are considered that they are satisfied if they answer either agree or strongly agree for the LIKERT scale questions and that information was re-coded into new variables.

APTS standard vouchers: Model 19(to receive medications, medical supplies and equipment) and Model 22 (to issue each items to different dispensing units) and APTS implementation has been standardized by the Federal Ministry of Finance.

APTS sales tickets: sales tickets for APTS implementation have been standardized by the Federal Ministry of Finance.

Efficient budget utilization: increase sales income and expires at a rate below 2%

Medicine sales volume: is the proportion of pharmaceutical sales divided by the amount of stock on hand.

Key medicines: Medicines that are used to treat ten of the most common disorders.

Rate of expiry: It's a percentage determined by dividing the stock available for sale by the expired value in monetary terms.

2. LITERATURE REVIEW

2.1. Theoretical Review

The idea of PTS arose when employees and administration at Debre Markos Institution in Ethiopia's Amhara region noticed that the hospital's inadequate management of pharmaceutical services was preventing the hospital as a whole from meeting the goals outlined in Ethiopia's Hospital Reform Implementation Guidelines (EHRIG). Debre Markos management requested the SPS Project in 2010 for technical help to improve the hospital's pharmaceutical services. In answer to the current desire, a new and comprehensive intervention known as APTS was born.

APTS is a data-driven set of interventions intended to make pharmacy practice more accountable, transparent, and responsible. It allows health-care facilities to make the best use of their pharmaceutical budgets, increase access to medications, and reduce waste. APTS keeps track of the number, mix, and success of pharmacy employees. It also enhances the architecture and workflow of the pharmacy. It provides accurate and consistent information for decision-making by enhancing recording and documentation. As a result, APTS increases the overall quality of pharmacy services, increasing patient knowledge and satisfaction. In the end, it leads to improved health outcomes. The framework is designed to allow for auditing of pharmaceutical transactions and services at any time. [Ayalew A et al, 2012]. After seeing the promising results achieved by hospitals the Ministry of Health (MOH) decided to begin deploying APTS at federal and university hospitals after hearing from

hospitals that had already done so. Furthermore, the Ministry is developing a major medication purchase plan to improve patient access to vital and specialty drugs. The Ministry oversees a number of significant federal and university hospitals, the majority of which are designed to provide tertiary care.

APTS generally requires careful planning and implementation of interventions, as well as accurate tracking and evaluation of progress and outcomes. To see if there have been any improvements as a result of APTS implementation, the results must be calculated and compared to baseline data.

2.1.1 Five Pillars of APTS

APTS interventions fit into one of the five outcome areas listed below, which agree to the five system strengthening basic components.

Good Governance: Transparency and responsibility in the management of medical transactions

Human capital: Workforce deployment and development that is effective

Information: produces trustworthy data

Financing: Budget usage that is efficient

Service provision: consumer satisfaction has increased

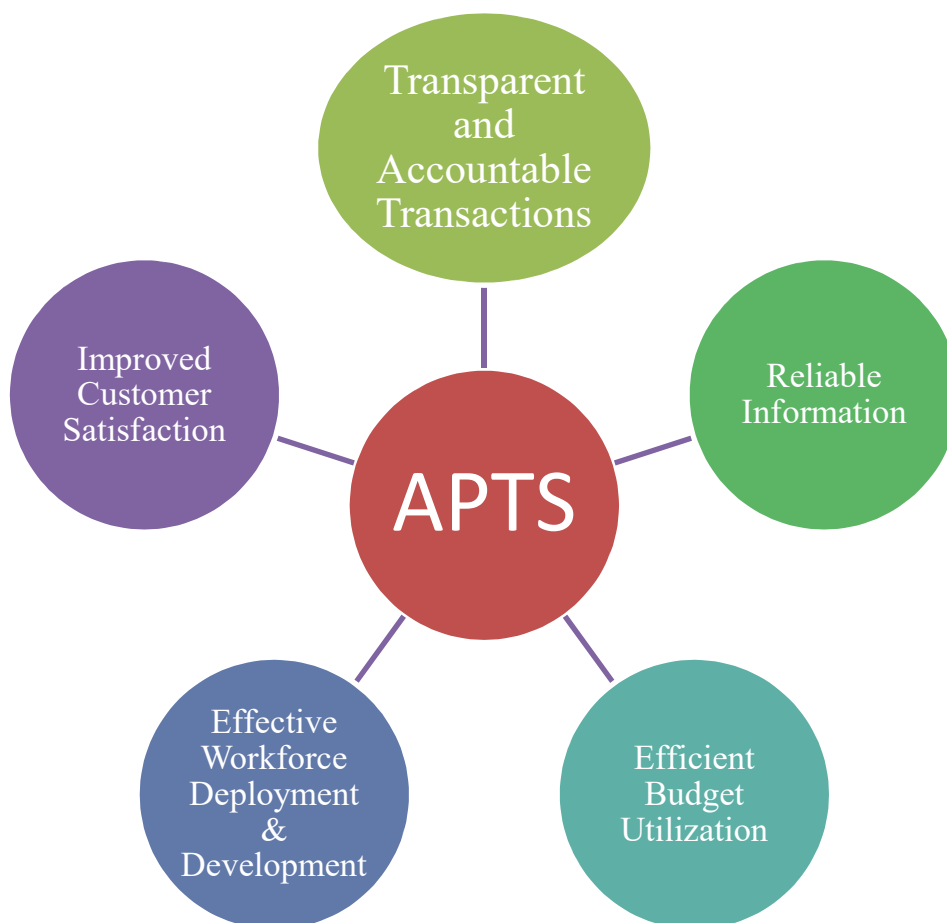


Figure 1: APTS's primary outcome area (Adinew et al, 2012)

2.1.1.1 Transparent and Accountable Transactions

Hospitals should provide a transparent and accountable mechanism for receiving, issuing, and dispensing pharmaceuticals. Receiving at the pharmacy, distributing to clients, delivering to the dispensing unit, collecting at dispensing components are all transactions.

The following activities should be carried out by hospitals in order to ensure that transactions are visible and accountable:

- To identify and record medications that have been traded, use traditional financial vouchers, sales tickets, registries, and paperwork.
- All medications are labeled, and all drugs that are transacted should be traced using unique identifiers.
- When it comes to transactions, medicines should be described in detail, including its name, dosage form, lot number, and expiry date
- Documentation should be provided for all medicine sales and the real price of medicine should be reconciled by applying an adjusted sales method on a regular basis.
- Hospitals should establish bin management and individual accountability at all dispensing units.
- To establish a collaborative effort in managing medicines and transactions, hospitals should assign collective responsibility to specialists operating in a single dispensing unit.
- Random product audits, monthly financial audits, and quarterly service audits should all be carried out at all hospitals.

All transactions should be carried out using models, sales tickets, and dispensing registers that are legally approved and unique to pharmaceuticals. The movement of medications from distributors to hospital end users should contain the following:

Receiving: The hospital Pharmaceuticals Store should receive and manage all pharmaceuticals (medicines, lab reagents, medical supplies, and equipment). Physical

inspection is used to assess the quality and quantity of medications before they are added to the store's inventory.

Issuing: Each dispensing unit should have an agreed-upon list of drugs to be stocked, including the maximum (one month) and minimum (two weeks) quantities. The pharmacy department director/head or pharmaceutical supply management unit head should approve each dispensing unit's stock list before it is delivered to dispensaries. Each dispensing unit should keep Bin Cards for all medicines in the unit, with bin owners sharing accountability.

Transactions at the dispensary: The six dispensing phases should be realized through the provision workflow. The dispensing procedure begins when the pharmacist receives and examines the prescription. The pharmacist should next calculate the cost of the medication and notify the patient or caregiver. After that, the medicines are written on a sale ticket with unique identifying numbers and retail price. The sale receipt is then delivered to the cashier. Once payment is made, the cashier delivers the prescription to the processing pharmacy personnel. He or she selects, counts, assembles, and delivers medicines with the prescription to the counselor pharmacist. The counseling pharmacist then packs, labels, verifies whether payment is impacted, and provides the medication to the patient along with verbal and written counseling.

The dispensing process is depicted below.

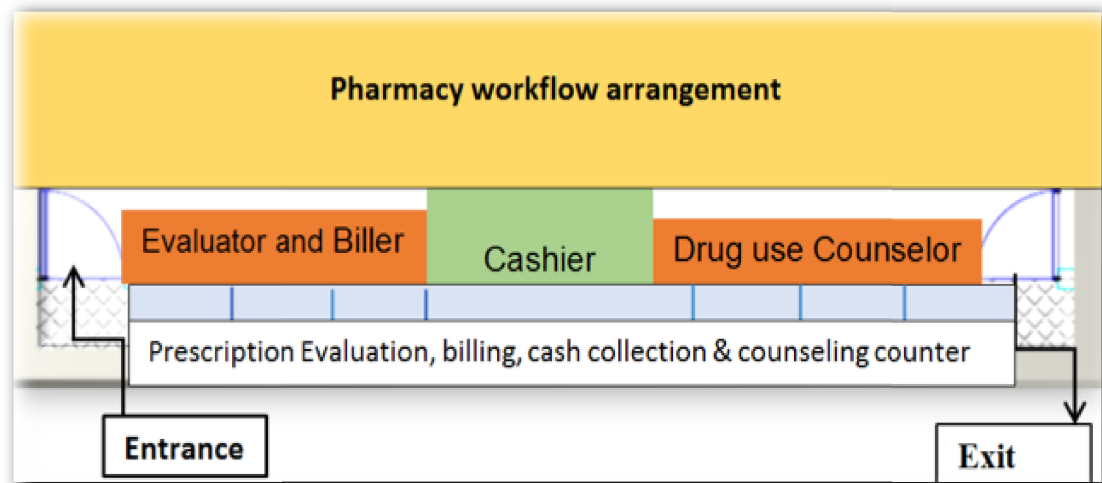


Figure 2: Pharmacy Workflow Arrangement (EHSTG, 2017)

2.1.1.2 Efficient Budget Utilization

ABC value analysis should be performed on a regular basis and reconciled with VEN categorization, with the results used to guide decisions during subsequent procurements. Procurement should only be done from the hospital's medication list. A regular stock status and consumption stock analysis is carried out to identify medicines that are about to expire. The hospital recognizes drugs that are about to expire and takes preventative efforts to keep wastage and expiration to less than 2%.

2.1.1.3 Effective Work Force Development and Deployment

All employees in the pharmacy department should have a defined job description. The workload should be calculated and each unit's level of performance should be evaluated. Depending on their burden, hospitals should take appropriate steps.

2.1.1.4 Reliable Information for Decision Making

The overall amount of customers served per treatment center, per dispenser, and per month, broken down by service type. This data should be used to make decisions. To inform future service improvements, product information such as consumption-to-stock ratio analyses and the availability of drugs for the top ten illnesses, rate of expiry, and affordability should be used by hospitals.

2.1.1.5 Improved Customer Satisfaction

The ultimate goal of the hospital pharmacy service is to increase overall patient satisfaction by making improvements through increasing the availability of medicines, optimizing the location and flow of work, and delivering high-quality pharmaceutical services. It is vital to improve customer convenience and reduce waiting time by reducing patient transit between dispensing and finance departments by enabling one-stop shopping. Furthermore, expanding the number of dispensing areas in accordance with patient load reduces patient wait times, increases privacy, and extends treatment time (for prescription evaluation and counseling). Such programs foster an environment in which patients are more

equipped to follow their doctors' orders by enhancing their knowledge and attitude. Furthermore, they protect patients from the unintended consequences of inappropriate medication use. Patient satisfaction with pharmacy services should be measured on a regular basis by the hospital.

Table 1. Key outcome areas and implementation procedures are measured with core indicators.

Result Areas	Pointers
Transparent and responsible transaction	<ul style="list-style-type: none"> ❖ Keeping track of and reporting on medicine waste on a yearly basis ❖ Internal auditing should be performed at least once every year. ❖ Tracking pharmaceutical sales and reconciling them with real medicines delivered on a regular basis
Budget usage that is efficient	<ul style="list-style-type: none"> ❖ Based on monetary value, the proportion of expired medicine ❖ Average income from pharmaceutical sales ❖ Analyzing the stock situation ❖ Reconciliation of ABC and VEN
Information generation	<ul style="list-style-type: none"> ❖ presenting financial reports on a monthly basis ❖ Creating monthly updates on service delivery ❖ The % of the difference between the amounts of medicine recorded on the bin card and the real physical count. ❖ MOH provided monthly input on APTS indicators/performance.
Improved customer satisfaction	<ul style="list-style-type: none"> ❖ The proportion of customers who are aware of the right dosage of given medications. ❖ Overall customer satisfaction as a percentage ❖ The average number of important medications available (30) pharmacy stores ❖ The average number of important medications available (30) in dispensing units. ❖ Typical stock out length ❖ The proportion of prescription drugs that are truly dispensed

Source: (Teferi et al, 2016)

2.2 Empirical Review

In view of rising prices for new medicines and ongoing problems with drug shortages, WHO (2018) described "access to medicines" as a multidimensional problem [Greene, 2010]. The availability of essential medicines is dependent on efficient supply chain systems, among other factors, and the continuous and adequate supply of medicines is a key element in managing diseases, especially chronic disease [Meyer JC et al,2017]Medicine shortages have hampered the successful delivery of high-quality healthcare services in many countries, including Ethiopia [McLaughlin M, 2013]. Regardless of the economic status of countries [Gray A and Manasse HR,2012] shortages of even basic drugs have become a global issue. More than half of the world's populations are deprived of basic services [Goldsack et al, 2014]. Medicine shortages are exacerbating the crisis. Different studies showed that there is a shortage in the availability of key essential drugs in different countries (Yang 2010).

In a study published in 2014, 64 percent of pharmacists in the United States said their facility had fully run out of at least one injectable oncology medication in the previous 12 months, and 25 percent said one or more safety events had occurred at their facility as a result of medicine shortages [Goldsack et al, 2014].

A recent study of hospital pharmacists in Europe found that there has been a substantial rise in drug shortages across Europe, with 91.8 percent of hospital pharmacists experiencing shortages in 2018 compared to 86.2 percent in 2014, with 35 percent experiencing shortages on a daily basis and 38 percent experiencing shortages weekly

[EAHP,2018], which is a cause for concern. Other continents and nations, such as Africa, are also experiencing severe shortages. There are also considerable shortages in other continents and countries, including other low and middle-income countries.

According to a 2003 evaluation of Ethiopia's pharmaceutical industry, the total length of critical medication stock-outs in public health facilities and regional drug stores was 99.2 days in the previous year. Expiration and waste of scarce resources resulted from the accumulation of drugs that were of limited use to the catchment community, with an estimated 8% of expired medicines in health institutions. Furthermore, 43 % of prescriptions administered to patients in health institutions were found to be insufficiently labeled, and 33 percent of individuals who received medications did not know how to properly take them. Also, antimicrobial prescribing was 58 percent, and antimicrobial use in the management of non-acute respiratory tract infections was 61 percent, according to the fourth National Health Sector Development Program (2010/11–2014/15), both of which are above prescribed guidelines [HSDP, 2010]. The pharmaceutical sector's weak governance was to blame for all of these issues. Pharmaceutical transactions and facilities were particularly vulnerable to mismanagement due to a lack of transparency and accountability, which resulted in fraud. As a result of inadequate planning, decision-making, ordering and dispensing, and reporting, medication availability and usage are endangered.

The availability, accessibility, acceptability, price, and consistency of pharmaceuticals are used to determine whether or not a health facility is ready to deliver healthcare services. [Gedif T et al, 2016]. According to (WHO, 2015), medication

availability is a key determinant of where individuals seek medical treatment and how happy they are with it. In another study, weak governance in the pharmaceutical sector, as well as a lack of auditing standards, transparency, and accountability, decreases access to essential medicines, raises drug costs, increases health spending, and depletes scarce health system resources [Walkwiak ,2018]. Transparency and accountability will help to reduce the risk of corruption and unethical behavior while also boosting public confidence in government institutions [Vian T, Kohler JC, Forte G, and Dimancesco D, 2017].

The Medicines Transparency Alliance, which ran from 2008 to 2015, aimed to improve access to medicines by increasing transparency and accountability in the pharmaceutical sector, using a multi-stakeholder approach. According to an APTS assessment conducted in 2016, 25% of APTS implementing sites performed financial auditing of pharmaceutical transactions, and more than two-thirds of APTS implementing sites practiced random product auditing. Prior to the implementation of APTS, none of the hospitals kept track of drug sales; reported regular amounts of medicine dispensed, or produced once-a-month updates on service delivery. Approximately 73% of APTS-implementing institutions completed every one of this actions.by the end of 2015[Hailu T, Ejigu E, Geremew E, and Adinew A, 2014].

Pharmaceuticals also contribute significantly to household health expenditures and account for 45% to 57% of out-of-pocket payments. Global spending on medicine is forecasted to reach USD 1.2 trillion in 2017 and account for up to 67% of total health expenditures in some countries [McLaughlin M et al, 2013]. More than 50% of citizens

believed that the health sector in their country was corrupt or very corrupt [Global corruption, 2013]. A WHO report 2016 identified practices ranging from theft and diversion of medicines and medical devices across the international health supply chain, to widespread medical billing and insurance fraud for services never rendered. Corruption puts health systems at a heightened risk [Slot B et al, 2017].

Transparency and accountability can reduce vulnerability to corruption and unethical practices and improve public trust in government institutions [Vian T, et al, 2017]. Transparency is both an end in itself and is instrumental in enabling accountability [WHO, 2016].

After implementing APTS in Ethiopia, a 2014 ABC analysis of medicine expenditures More than 96 percent of goods bought at three Tigray area hospitals were on the institutions' medication lists. The VEN categorization system was used by hospitals to ensure that the medications purchased were relevant to the health requirements of the hospitals' target population. [Hailu T, Ejigu E, Geremew E, and Adinew A, 2014].

Minimizing wastage of medicines is another means of ensuring efficient budget utilization. [SIAPS, 2015].reported that in most facilities, in Ethiopia, drug loss due to expiration has dropped from 8.24 percent to less than 2%.

According to Barbazza.E et al 2016, a pharmaceutical system comprises all structures, people, resources, and processes and their interactions within the broader health system that aim to ensure equitable and timely access to safe, effective, quality-assured

pharmaceutical products and related services that promote appropriate and cost-effective use to improve health outcomes [Barbazza.E et al 2016].

The pharmacy workforce is critical to the pharmaceutical service's success. [WHO, 2015]. In Ethiopia, hospital pharmacies should be arranged as outpatient, inpatient, and emergency pharmacies, as well as a central medical store managed by a certified pharmacist [EHRIG, 2010]. Furthermore, the hospital must have enough staff, apparatus, buildings, and facilities to keep pharmaceutical goods and carry out compounding, dispensing, and counseling services. The work flow should be arranged such that people enter one gate of the pharmacy outlets and depart another. The communication process should be arranged such that people enter one gate of the pharmacy outlets and depart another, in this manner, within the pharmacy, clients can observe the prescription evaluator, biller, cashier, and medicine use counselor in a queue.

Strategies for Interventions in Procurement of medicine through EPSA and other options for developing and promoting a policy and legal framework for pharmaceutical transactions and services. [Hafner T et al, 2016].

The pharmacy is one of the most accessible and frequently used front-line healthcare entities. Fay (2020) highlighted, when analyzing North Carolina Medicaid claims data, that the portion of the population most in need of medication management visits their local pharmacy 20–35 times annually [Fay A.E et al, 2020].

Client satisfaction with pharmacist services is an important metric for assessing the quality of pharmacy services provided to customers and the implementation of

pharmaceutical care in hospitals [Ahmed.A et al, 2016]. Customers who are satisfied with their pharmacy services are more likely to take their medications as directed and are less likely to switch from one health care provider to another. Patient satisfaction is an important humanistic outcome as it is a patient's subjective assessment of healthcare services. A previous study demonstrated that patient satisfaction related to medication was potentially important to patient-reported outcomes linked to better adherence, which has been a major concern in health care.

2.3 APTS evaluation conceptual framework

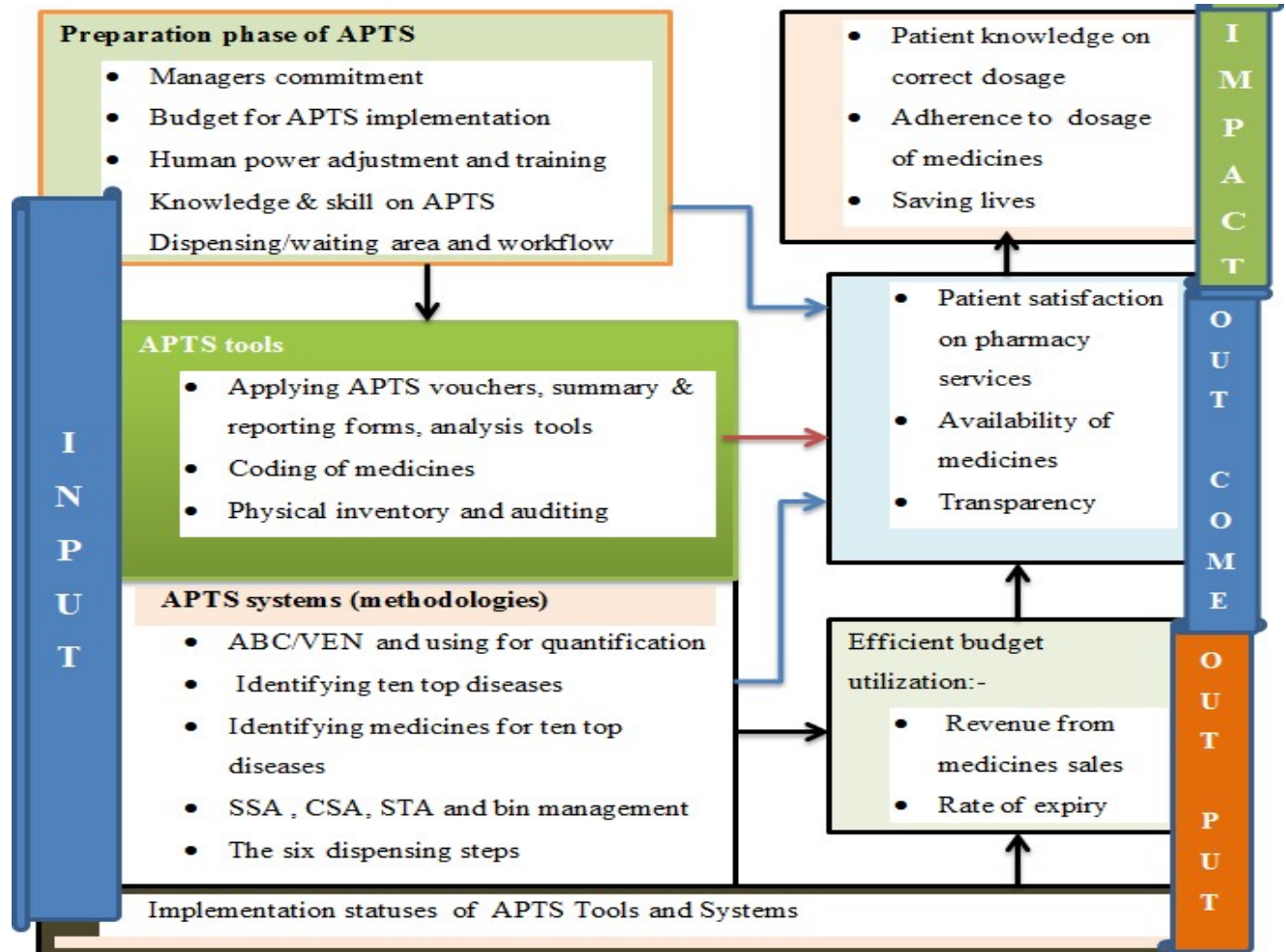


Figure 3: APTS evaluation conceptual framework; modified from Logic Model Flowchart For Program Evaluation, March 2015

3. METHODOLOGY

3.1 Area of Research

Tikur Anbessa Specialized Hospital is the largest teaching hospital associated with Addis Ababa University's College of Health Science, and has been offering services since 1973. It acts as a teaching center for medical, pharmacy, and other health science students at the undergraduate and graduate levels. It is also a place where the entire nation receives specialized comprehensive and therapeutic services not offered by other public or private institutions.

Around 465 doctors, 88 pharmacists, 992 nurses, and 115 other health care staff work at the hospital to provide patient care. It also employs 950 people in administrative and support roles.

In the hospital, patients are cared for by various departments, faculty members, and residents who have completed specialty training at the school of medicine. In addition, this hospital serves as a referral unit and training site for almost all state and federal hospitals in Addis Ababa. The hospital's 20 outpatient specialty clinics, inpatient, and emergency departments treat more than 500,000 people each year.

Pharmaceuticals, as well as medical supplies, are provided for all of TASH's facilities by the pharmacy service directorate, which is divided into six case teams and more than 15 pharmacy outlets. Since 2017, TASH has been using the national APTS to make processes more transparent and accountable, as well as automating the warehouse with HCMIS

software to make the logistics management information system accessible and improve service effectiveness.

The warehouse is divided into two sections: medicine and medical supplies. It meets the needs of each pharmacy unit, other hospital departments, and the TASH catchment area.

3.2 Research Design

The only way to collect views, opinions, attitudes, and ideas for improving procedures is through a descriptive survey. [Koul,1992]. So, a facility-based cross-sectional descriptive study design that incorporates both qualitative and quantitative approaches was used.

3.3 Data Source and Data Type

The data for this study came from both primary and secondary sources. Primary data would be gathered from responders who have had firsthand experience with the implementation process and are believed to have useful knowledge of the topic (such as: Head of pharmacy, pharmacy personnel, financial director, internal auditor, and customers). Monthly inventory reports and ABC/VEN analyses, and stock status analysis were used as secondary sources all of which were obtained from hospital records.

3.4 Method and Instrument for Data Gathering

The study's primary and secondary data were collected using both qualitative and quantitative approaches. The data collection instrument is based on (MOH and USAIDS, 2014). The LIKERT scale question, a five-point scale questionnaire, is the primary tool for gathering quantitative data from patients and pharmacists. To supplement the quantitative results, key informant interviews were conducted with the hospital's pharmacy director, finance director, and internal auditor. The data was also supported by an analysis of related records and observations. To collect information on appropriate indicators, Documents pertaining to bin/stock cards, as well as reports on pharmaceutical wastage, were examined. Direct inspection of the facilities generates information on the availability of important medications and the accuracy of records. During the visit, real observations of drugs on the shelf were used to estimate medication availability. The data from the stock/bin card was collected and compared to a physical count to determine record accuracy. A difference was identified if there was a mismatch between records and actual counts.

3.5 Population and sampling technique

The study's target population included employees from departments of pharmacy, finance, and human resources were involved in the introduction of APTS, as well as clients who received services from the hospital's outpatient pharmacy during the data collection period.

For the quantitative data, all pharmacy professionals (88 in total) were used as respondents, and the sample size of clients was determined using the single proportion formula (Reddy, 2006 & Getahun, 2010). The yield of the estimated sample size was determined using data from a previous study on the proportion of patients satisfied, which was found to be 74 percent (FMOH, 2015). The sample size was calculated using the assumptions listed below.

$$n = \frac{(z_{\alpha/2})^2 \cdot pq}{d^2}$$

Where:

n = sample sizes,

Z = the standard (typical) normal distribution,

d = the degree of accuracy,

p = a percentage of the target population thought to have certain qualities

In this instance, Prevalence/ proportion of patient satisfaction = 74% = p = 0.74, q = 1 - p; q = 0.26

Confidence interval: 95%, alpha = 0.1, and margin of error/degree of accuracy: 5%

Then: $n = (1.64)^2 * (0.74 * 0.26) / (0.05)^2 = 207$ and counting 10% contingency (non-response rate) gave a total of 228 clients.

The research population (clients) was then recruited using a systematic random sampling approach. Every day, the hospital treats around 820 patients, of which 409 clients

visit the pharmacy, and over the two-week data collection period, the hospital pharmacy was anticipated to serve about 4,090 customers. As a result, the sample fraction (k) was determined to be $4090/228 = 18$. A starting point was picked at random from the integers 1 through 18. Then, every 18th customer was taken into account.

In addition, the data was supplemented by an in-depth interview with three important informants, including the hospital's pharmacy director, finance director, and internal auditor. The informants are intentionally picked because they are considered to provide important insight into the phenomena being studied.

3.6 Procedures for Data Collection

TASH received an official letter from AAU and, upon receipt of permission from the pharmacy director of TASH; all responders were given open and closed-ended questionnaires over the course of four weeks. A few selected responders were interviewed, and organized files were evaluated by the appointed staff in the region.

3.7 Techniques for Analyzing and presenting data

After being adjusted for completeness and consistency, the quantitative data was evaluated using descriptive statistics. The information was delivered by using percentages and frequency counts. Content analysis was used to analyze the qualitative data.

3.8 Data Quality Management

The tools were originally prepared in English to improve the consistency of the tools prepared. To decrease linguistic obstacles during the interview, a portion of the tools used for the patient exit interview were translated into the respective areas' local languages. After entering quantitative data into SPSS 2022, all questioners were checked to verify proper data input.

3.9 Criteria for Inclusion

- All pharmacy and financial employees have worked at the pharmacy for at least six months.
- During the study period, patients who got pharmacy services in the chosen hospitals and Participants had to be over the age of fifteen and willing to take part in the study
- Monthly APTS reports

3.10 Criteria for exclusion

- Employees who are on yearly leave throughout the research period;
- Employees those are unable to work due to illness during the study time.
- Employees who have only been at the hospital for six months or less.
- Patients who were very sick and unable to provide information, as well as those who refused to do so, were excluded.
- Documents that are disorganized

3.11 Ethical Consideration

Prior to the interview, each respondent gave their oral informed permission for patient understanding, availability of prescription drugs, and satisfaction. Names of respondents from whom information was received were recorded and evaluated using uniquely identifying codes for the purposes of confidentiality and ethical considerations. Furthermore, because the information sought was not private or sensitive, respondents were not subjected to psychological harm as a result of the study.

4. RESULTS AND DISCUSSIONS

4.1 Qualitative data results

4.1.1 Interview with the director of the pharmacy department

4.1.1.1 Interviewee Characteristics

The pharmaceutical section head interviewed was a man with about 6 years of professional experience, although he had only been in his current position job for two years. In addition, the interviewee stated that he had received APTS training.

4.1.1.2 Effective work force deployment

One of the important APTS implementation enablers is, based on APTS system design assumptions, the availability of qualified and motivated human resources. The APTS human resource categories with significant shortages, according to respondents, were allocated pharmacy staff and pharmacy accountants. Attrition was a concern in the hospital, according to the pharmacy director interviewed. Workload and the lack of an indemnity policy were ranked first and second, respectively. According to the pharmacy section head, patient care indicators and satisfaction surveys were not conducted. In addition, a survey is conducted on a monthly basis to determine how long patients must wait for pharmacy services was not conducted. The biggest obstacles encountered during the adoption of APTS, according to the head pharmacy, were attrition among pharmacy workers and pharmacy accountants, higher workload and shared responsibility, which is not supported by the indemnity policy. The pharmacy department conducted a workload analysis on OPD

Pharmacy utilizing the number of counseling patients per pharmacist and discovered that pharmacists had a high workload (70-100 counseling patients per pharmacist per day). A pharmacist can advise 45-50 patients every day, according to the APTS. One of the strategies used to determine the number of employees in each unit who require attention is workload analysis. It is information about each employee's workload in each hospital work unit. And the interviewee also believed APTS was poorly implemented.

The budget is allocated by the hospital board, according to the pharmacy head. In 2012, the EC, the pharmacy department, reported that their pharmaceutical budget was insufficient, with only 80 million birr allocated. But at the end of the year, they used 103,650,601.6 ETB. Additionally, almost one fourth of the allocated budget is needed.

Most Ethiopian hospitals reported having insufficient budgets for medications, with the average number of months covered by the assigned budget being 7.84, according to (Tadeg et al, 2014). This study was conducted nationally and took an average month. Mazi and his colleagues conducted a study in Nigeria in 2010. The purchasing of essential medications and supplies for Nigeria's Primary Healthcare Centers has been declining. Despite a slight increase in overall budget, when inflation and currency rate deterioration are taken into account, the overall trend is downward. The Drug and Therapeutics Committees (DTCs) established and approved VEN-classified hospital-specific medicine lists that were used in the decision-making process for pharmaceutical purchase forecasting. When calculating ABC value analysis, the hospitals used three years of data. The data gathered through VEN categorization and ABC analysis was combined to provide data that could be

used to make decisions. The significance of ABC value analysis, VEN classification, and harmonizing the two is crucial for ensuring medicine availability needed to meet the hospitals' catchment populations' most pressing public health requirements. These tried-and-true methods assist budget managers in allocating restricted resources to the most vital drugs, those that are most relevant to the hospital's patients. On a regular basis, stock status analysis (SSA) is performed (every month).

4.1.1.3 Transaction Transparency and Accountability

The respondent indicated that TASH had basic APTS equipment on hand, including models 19 and 22 (modified), cash sales tickets, and dispensing registers, in this evaluation. A financial breakdown for cash transactions and free medication distribution was also reported on a daily basis. Another sign of a hospital's open and responsible pharmaceutical transaction system is a complete count of the physical inventory in the store every six months and in the dispensary on a regular and timely basis. TASH conducted a physical inventory in this regard, which took two days. The most common measurements are transferring to other health care institutions, selling to other organizations, and exchanging medications. Given its importance in guaranteeing the continued supply of drugs and reducing expiration, this should be supported as well.

Table 2: Total Wastage rate

In 2012, EC Beginning Balance ETB	(Both budget and program) Medicines Received Total Value	Medicines' worth is being wasted in ETB			
		Items that have expired or been damaged in ETB	Total value of Expired and Damaged	Rate of Wastage in	
		Budget	Program		
27,180,655.783	76,496,945.794	346,717.85	5,722,320	6,069,037.85	5.85%

Wastage rate in percentage = $\frac{\text{the cost of medications is being wasted in ETB}}{\text{Beginning balance + Total value received (ETB)}} \times 100$

$$= \frac{6,069,037.85}{103,677,601.577} \times 100$$

$$= 5.85\% (5,182,530.08 \text{ ETB})$$

The pharmaceutical wastage rate was calculated using documentation from the hospital's yearly at the end of the year, physical record and monetary reports are required. The total amount of money being spent on medicine over the year (unused stocks + stock on hand). The EHRIGs (2010) set a standard that the wastage rate in monetary value in health facilities should be less than 2%, but it was found to be 5.85% in this study. According to Nakyanzi semi-structured questionnaires were used to conduct In Kampala and Entebbe, a cross-sectional inspection of six community and thirty two private medical stores was conducted. The study's findings revealed that pharmaceuticals and medicines utilized in vertical programs, donated drugs, and those with a slow turnover are all susceptible to expiration [Nakyanzi et al, 2010]

According to a 2003 evaluation of Ethiopia's pharmaceutical business, the accumulation of drugs that were only marginally useful to the catchment population resulted in expiration and a waste of limited resources, with expired drugs purportedly found in health institutions accounting for up to 8% of the total(APS,2003).

4.1.2 Interview with the hospital auditor

4.1.2.1 Interviewee characteristics

The hospital's internal auditor interviewed was a male with around 8 years of work experience as a professional and has been employed at this location for the past five years. In addition, the interviewee stated that he had received APTS training.

4.1.2.2 Transparency and Accountability of Transactions

It's always been difficult to audit the pharmacy department. The core issue is a lack of standardized, transparent, and accountable pharmaceutical management practices and pharmaceutical revenues (FMOH and USAIDS, 2014). According to the auditor, the most frequent method of auditing medicines in hospitals was choosing a random sample of items and matching them with various financial papers. As a result, the hospital's auditor mistakenly believed that APTS supported him in auditing pharmaceutical transactions, and that was not the case before. Though, the absence of steady financial auditing and physical recording of a huge quantity of items remained described to be the key encounters regarding the auditing job. It was also reported that the absence of steady auditing could be the cause for low difference detection.

4.1.3 Interview with the hospital finance head

4.1.3.1 Interviewee Characteristics

The hospital's head of finance interviewed was a man with about nine years of work experience as an expert and has been in this role for the last four years. In addition, the interviewee stated that he had received APTS training.

4.1.3.2 Efficient Budget Utilization

The interviewee reported that the percentage of expired drugs was reported monthly on a fiscal basis, this is one of the key markers of effective budget utilization. Stock must be examined on a regular basis to make the most of the medicinal budget, because it demonstrates how much stock is on hand and also how long it will last. Tikur Anbessa Specialized Hospital examines its stock in this situation, although not on a daily basis. The biggest problems, according to the respondent, were poor SSA analysis and ABC/VEN reconciliation. The auditor was able to supervise the accounting activities of the hospital pharmacy as a result of this.

4.1.3.3 Information generation

According to the respondent, among the markers for information generation, TASH is dedicated only to the submission of service reports on a monthly basis. In addition, regular response from the board was not received on the hospital's APTS performance has been a problem. It was also reported by the finance head that discrepancy analysis between the

quantities of medicine recorded on the bin card and the actual physical count is not regularly conducted.

4.1.4 Discussion on Qualitative data

The paper describes the results of the APTS implementation, which is a new effort aimed at improving pharmaceutical service quality. The new strategy was created with the goal of improving the foundations of health systems (WHO, 2010). The purpose of this section is to address issues with TASH performance during APTS implementation.

The crucial workers who design and deliver the services must have the necessary knowledge, skills, motivation, and deployment to accomplish the APTS objectives. TASH sought to provide the required mix of human resources in dispensaries, according to the current assessment, whereas the pharmaceutical department's director indicated that there is still a shortage. According to Teferi human resource shortages in underdeveloped countries are exacerbated by attrition. High turnover has a negative influence on health-care quality because it raises workload, undermines team trust, causes work process disturbances and inefficiencies, and leads to the loss of institutional knowledge; it has a negative influence on health care quality (WHO, 2006). According to the current assessment, attrition among pharmacy staff was the major challenge.

4.2 Results from Quantitative data

4.2.1 Pharmacy Professionals' Perception of APTS

Table 3: Pharmacy professionals' socio-demographic and job-related data at TASH, 2021 (n=73)

Variable		Frequency
Gender	Male	53.40%
	Female	46.60%
Marital status	Unmarried	54.80%
	Goten	45.20%
	Divorced	0.00%
	Widowed	0.00%
Qualifications in education	First	47.90%
	MSC in	52.10%
	Others	0.00%
Years of service totaled since graduation	<3	12.30%
	3-6	45.20%
	>6	42.50%
The number of years you've been at your current employment (in this Hospital)	<3	24.70%
	3-6	58.90%
	>6	16.40%
Average amount of hours worked each day	8-10	26.00%
	>10	74.00%
Monthly duty hours	<100 hours	4.10%
	100-150hrs	2.70%
	>150hr	93.20%
In your hospital, do you have access to a documented job description?	Yes	29.40%
	No	70.60%
What is your primary field of practice?	ART	0.00%
	Clinical	13.70%
	OPD	63.00%
	DSM	1.40%
	Inpatient	21.90%

Source: Own Survey, 2021

A total of 73 pharmacists were given the questionnaire, as indicated in Table 3. The vast majority of them were men (53.4%). More than half of the participants (58.9%) had more than three years of professional experience and 45.2% had 3-6 years of experience in TASH. 54.8 percent of the respondents were single and 52.1 percent had a second degree (M-Pharm). OPD Pharmacy was the primary field of practice for the majority of responders (63%), followed by inpatient pharmacy services (21.9%). All of the respondents have received APTS training. Performance evaluations and promotions are likely to be skewed without job descriptions (Bradley 2008). In this study, 70.6 percent of those polled had no job description.

The vast majority of professionals believe that APTS provides employment opportunities for pharmacists and improves the transparency of drug transactions and pharmacy record keeping practices (68.5%, 72.6%, and 90.4%, respectively).

Table 4. Pharmacy professionals' views on different aspects of APTS implementation at TASH, (n=73)

Variable	Disagree /Strongly disagree	Neutral	Agree /Strongly agree
The introduction of APTS augmented the availability of medicines.	40(54.8%)	9(12.3%)	24(32.9%)
The adoption of APTS increased the number of available jobs for pharmacists.	17(23.2%)	6(8.2%)	50(68.5%)
The use of APTS has resulted in a reduction in medication expiration.	13(17.8%)	8(11%)	52(71.2%)
The use of APTS has reduced medication theft.	10(13.7%)	21(28.8)	42(57.6%)
The adoption of APTS has not aided in the reduction of medication harm.	27(37%)	9(12.3%)	37(50.7%)

The use of APTS has increased the transparency of pharmaceutical transactions.	3(4.1%)	17(23.3%)	53(72.6%)
APTS has enhanced the pharmacy's record-keeping processes.	5(6.8%)	2(2.7%)	66(90.4%)
Patient satisfaction has increased as a result of APTS adoption.	16(22%)	28(38.4%)	29(39.8%)
Other hospital departments, such as laboratory, nursing, and radiology, are more happy with the pharmacy department's service after the implementation of APTS.	24(32.9%)	33(45.2%)	15(20.5%)
The implementation of collective responsibility shared by all pharmacy experts in a unit increased accountability.	9(12.3%)	20(27.4%)	44(60.3%)
Pharmacists were assigned bin positions at dispensaries, which enhanced drug supply.	25(34.2%)	4(5.5%)	44(60.3%)
Pharmacists were assigned bin placements at dispensaries, which enhanced the security of the drugs.	13(17.8%)	18(24.7%)	42(57.5%)
APTS has increased forecasting of required medications.	13(17.8%)	4(5.5%)	56(76.7%)
Patients' wait times for pharmacy services have been decreased thanks to APTS. (Please keep in mind that contacting the Rx evaluator is the first step in the service.)	38(52%)	12(16.4%)	18(24.6%)
Workflow improved with the introduction of APTS.	29(39.7%)	11(15.1%)	33(45.2%)
Rx evaluation improved with the introduction of APTS.	28(38.3%)	11(15.1%)	34(46.6%)
Medication counseling has improved after the adoption of APTS.	31(42.5%)	7(9.5%)	35(48%)
The introduction of APTS has resulted in an increase in the attrition rate of pharmacy professionals.	17(23.3%)	22(30.1%)	34(46.6%)
The use of APTS has resulted in increased budget usage efficiency.	13(17.8%)	8(11%)	52(71.2%)
APTS should be made available to all health-care facilities.	13(17.8%)	17(23.3%)	43(58.9%)
APTS is a critical project to enhance pharmacy service in general.	14(19.2%)	11(15.1%)	48(65.8%)

Source: own survey, 202

It also evaluated the opinions of pharmacy professionals on the expected results, the implementation process, and the APTS workload. More than half of respondents are satisfied

with most of the important outcome measures, as indicated in (Table 4). Increasing medicine supply, decreasing expiry and theft, and improving transparency and accountability; improving efficiency in budget utilization; improving record keeping; forecasting best practices.

However, the response to improving workflows was not very good, and the response to the idea of improving patient satisfaction and the satisfaction of other healthcare professionals in the nursing, laboratory, and radiology departments was neutral. On the other hand, 54.8% of the respondents agreed that APTS not improved the availability of medicines and 52% agree that APTS did not reduce the waiting time of patients.

Vitality of APTS

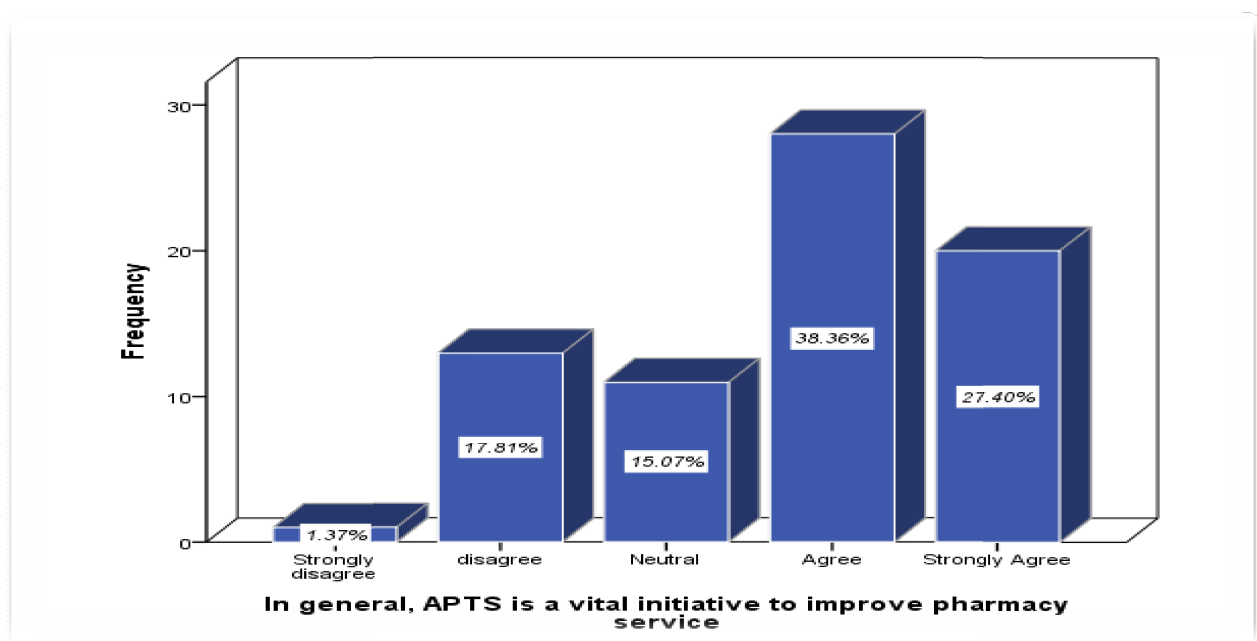


Figure 4: Vitality of APTS to improve pharmacy service: source –own survey, 2021
65.8% of Pharmacists agreed that APTS is vital to improve pharmacy services.

4.2.2 Job Satisfaction of Pharmacy Staffs

Table 5: Job Satisfaction of pharmacy professional (n=73)

Variables	Disagree/Strongly disagree	Neutral	Strongly agree/
Satisfaction with Supervision			
The supervisor I work with are supportive	18(24.6%)	13(17.8%)	42(57.6%)
My superior listen to me properly	17(23.3%)	6(8.2%)	50(68.5%)
I am fairly treated by the management of the hospital	53(72.6%)	15(20.5%)	5(6.8%)
My suggestion are usually given consideration by	30(41%)	20(27.4%)	23(31.6%)
My work responsibilities are made clear by my supervisor	19(26%)	11(15.1%)	43(58.9%)
Satisfaction with Coworkers			
I enjoy working with my colleagues in the hospital	13(17.8%)	17(23.3%)	43(58.9%)
The people I work with are responsible for their job	16(21.9%)	12(16.4%)	45(61.7%)
The people I work with give me enough support	14(19.2%)	16(21.9%)	43(58.9%)
The people I work with are cooperative	8(11%)	17(23.3%)	48(65.7%)
Payment Dissatisfaction			
My pay is adequate ,considering the responsibility I have	70(95.9%)	1(1.4%)	2(2.7%)
The hospital pays me fair benefits (transport, house rent...)	69(94.5%)	0(0%)	4(5.5%)
There are benefits we don't have that we should have	46(63%)	12(16.4%)	15(20.6%)
Promotional Satisfaction			
I like the basis on which the hospital promotes people	38(52.1%)	20(27.4%)	15(20.5%)
Promotion are infrequent in the hospital	17(23.3%)	15(20.5%)	41(56.2%)
Self-satisfaction with the Work			
My job is interesting	16(21.9%)	7(9.6%)	50(68.5%)
I would rather be doing another job	25(34.2%)	22(30.1%)	26(35.7%)
I feel unappreciated by the hospital for the work I do	21(28.7%)	8(11%)	44(60.3%)
I have too much to do at work	10(13.7%)	13(17.8%)	50(68.5%)
I often feel that I don't know what is going on the	20(27.4%)	24(32.9%)	29(39.7%)

I feel the sense of pride in doing my job	22(30.1%)	14(19.2%)	37(50.
I don't feel my efforts are rewarded the way they should be	13(17.8%)	10(13.7%)	50(68.
Work assignment are not fully explained	28(38.3%)	19(2%)	26(35.
My job makes good use of my skills and abilities	26(35.6%)	23(31.5%)	24(32.
I have a tools and resources to do my job well	47(64.4%)	18(24.7%)	8(11%
My work gives me a feeling of personal accomplishment	27(37%)	8(11%)	38(52
Training adequately prepared me for the job	44(60.2%)	6(8.2%)	23(31.
Premises and Facilities			
Sufficient attention is given to my job safety	57(78%)	10(13.7%)	6(8.2
Premises are convenient for conducting my duties	47(64.4%)	15(20.5%)	11(15.
Facilities are adequate for conducting my duties	57(78.1%)	9(12.3%)	7(9.6
Overall Satisfaction of Pharmacists			
Considering everything ,I am satisfied with my job	41(56.1%)	15(20.5%)	17(23.

Source: own survey, 2021

For hospitals to serve clients effectively, employee Job satisfaction is essential. Job satisfaction is defined as a "personal reaction to one's job experience" (Berry, 1997). Salary, incentives, advancement, supervision, colleagues, workplace conditions, communications, security, productivity, and the work itself are commonly used to gauge job satisfaction. Individual employees react differently to these issues. The job satisfaction of TASH employees is evaluated based on monitoring status, cooperation with colleagues, compensation, promotion, work itself, and pharmacy facilities and facilities. Hospital professionals believe that their remuneration is unfairly low and they believe that they should receive better benefits based on their contributions and responsibilities (Table 8). They are also dissatisfied with their working environment. 78% of the respondents indicated that they did not agree with or strongly opposed the place and facility. In summary, the satisfaction of

pharmacy professionals is low, with more than 56.1% of pharmacists disagreeing or strongly disagreeing. The results, on the other hand, suggest that pharmacy staff value their jobs and are able to improve the working environment with their coworkers. Overall, 56.1 percent of those polled were dissatisfied with their jobs.

4.2.3 Patient Knowledge of Dispensed Medicines

The sum of patients enrolled in the research was 200, accounting for 87.7% of the targeted sample size. The most crucial components of medical knowledge are the dose, mode of administration, frequency, and length of usage, without which patients may fail to take their medications correctly (FMHACA 2012). 200 outpatient pharmacy patients were interviewed after receiving their medicines to assess patient understanding of administered medicines.

Table 6 : Amount of Medicines Actually Dispensed, 2021(n=200)

Amount of Medicines Actually Dispensed			
Number of Prescriptions	Number of drugs prescribed	Number of drugs dispensed	Percent of dispensed drugs
200	850	464	55%

Source: own survey, 20221

A total of 850 medications were prescribed, with 464 of them being dispensed. As a result, medication was available in 55 percent of the cases.

Table 7: Customers knowledge on dispensed medications, 2021 (n=200)

Customers knowledge	yes		No	
	Count	%	Count	%
Customers knowledge on dose of dispensed medication	183	91.50%	17	8.50%
Customers knowledge on frequency of dispensed	164	82.00%	36	18.00%
Customers knowledge on duration of dispensed	133	66.50%	67	33.50%
Customers knowledge on route of dispensed medication	191	95.50%	9	4.50%

Source: own survey, 2021

As shown in the table above, 91.5 %, 82 %, 66.5 %, and 88 % of patients know the dose, frequency, duration, and mode of administration, respectively.

Table 8: Labeling information on dispensed medications

Labeling information	yes	No
Labeling contains medicine name	157(74.1%)	43(20.3%)
Labeling contains Frequency of drug	145(68.4%)	55(25.9%)
Labeling contains Quantity of	54(25.5%)	146(68.9%)
Labeling contains duration of	53(25%)	147(69.3%)

Source: own survey, 2021

4.2.4 Patient satisfaction with pharmacy service under different criteria

The parameters used to evaluate patient satisfaction are the dispensing area, dispensing process, environmental privacy, and assistance provided to patients, and the cost of medication. Except for the waiting area, 73% of respondents' patients are satisfied with the convenience of the pharmacy and dispensing area. Most patients also recognize the privacy of the environment. 94% of patients in the study agreed that the cost of medication is not fair. More than 73% of the interviewees admitted that they received good help from the pharmacy staff. The pharmacy staff's privacy and consideration for them were very poor, at

73.5% and 73% respectively. Comprehensive consideration, the overall satisfaction rate is 43.1% on average.

Table 9: Patient satisfaction with pharmacy service under different criteria (n=200)

Variables	Disagree /Strongly disagree	Neutral	Agree/Strongly agree
Area of Dispensing			
The pharmacy's location is conveniently accessible.	40(20%)	0(0%)	160(80%)
Generally, the waiting room is neat and pleasant.	119(59.5)	0(0%)	81(40.5%)
The dispensing room and counter make it easy to provide	54(27%)	0(0%)	146(73%)
Process of Dispensing			
The Pharmacist instructions on how to take the medicine are straightforward.	125(62.5%)	0(0%)	75(37.5%)
Your pharmacist advised you about proper drug storage.	147(73.5%)	0(0%)	53(26.5%)
The pharmacist's information informs you about the expected outcome of your medicine.	147(73.5%)	0(0%)	53(26.5%)
The speed with which prescription medications are processed	112(56%)	0(0%)	88(44%)
I was able to obtain all of the necessary medications from the pharmacy.	131(65.5%)	0(0%)	69(34.5%)
Privacy of patient			
My interaction with the pharmacist was kept private.	47(23.5%)	10(5%)	143(71.5)
Patient assistance			
The pharmacy professional spent an appropriate amount of time.	105(52.5%)	10(5%)	85(42.5%)
The pharmacy staff's politeness and respect for me	54(27%)	0(0%)	146(73%)
Others			
The cost of medications at the pharmacy is reasonable.	188(94%)	0(0%)	12(6%)
The amount of time I spend waiting for my prescription to be filled is reasonable.	105(52.5%)	0(0%)	95(47.5%)
Overall satisfaction			
Taking everything into account, I am pleased with the service provided.	126(63%)	5(2.5%)	69(34.5%)

Source: own survey, 2021

4.2.5 Availability and Duration of stock-outs for essential Medicines for TASH

TASH has a 63.33 percent availability of key tracer drugs in the medical store, compared to 55 percent in the dispensary, according to this study. In the last six months, the maximum stock-out period for several critical drugs was 150 days (5 months). Three days was the minimum stock-out period. This demonstrates that patients do not receive their prescribed medications, despite the fact that they are available in the hospital's pharmacy, and that they pay unnecessary fees at private pharmacies. Furthermore, such tactics result in the expiration of drugs, while patients face dispensary stock outs.

4.2.6 Records' Accuracy (Matching of Recorded Quantity with Physical Count)

The key drugs chosen were the same as those used to determine availability. The amount recorded on bin cards at the Medical store was checked against the actual physical count for each medicine. Despite the fact that eleven of the thirty goods were stock out, they were all appropriately documented.

5. DISCUSSION

The appropriate medication products, in the appropriate amounts, of the appropriate quality, at a fair price, at the appropriate time, and with suitable usage are all guaranteed by a well-functioning drug supply management system. As a result, transparency and accountability will be granted in the process of pharmaceutical transactions and pharmaceutical service supply [USAID, 2011]. The pharmacy practice would benefit patients while also increasing the pharmacist's contribution to medication therapy. [Carmichael JM et al, 2017]. The current study looked at how APTS was used at TASH.

The pharmaceutical industry's lack of openness can lead to resource waste. For proper decision-making, it is necessary to generate and report information on a consistent basis [USAID, 2011]. Pharmaceutical transactions and service interventions that are auditable help to enhance the country's pharmaceutical service delivery system by reviving a number of health-related initiatives for improved health outcomes.

In this study, the vast majority of professionals believe that APTS provides employment opportunities for pharmacists, and improves the transparency of drug transactions and pharmacy record keeping practices (68.5%, 72.6%, and 90.4%, respectively). In Ethiopia, studies found moderate [Tadeg H et al, 2014] and low levels of dissatisfaction [Teferi G et al, 2016]. Hospital professionals believe that their remuneration is unfairly low and they believe that they should receive better benefits based on their contributions and responsibilities [Leisinger KM, 2012]. They are also dissatisfied with their working environment. 78% of the respondents indicated that they did not agree with or

strongly opposed the place and facility. In summary, the satisfaction of pharmacy professionals is low, with more than 56.1% of pharmacists disagreeing or strongly disagreeing. Increased workload and attrition rates among pharmaceutical professionals were blamed for this. Due the lack of a performance management and incentive system, as well as the delay in developing an indemnification policy, a higher workload that was not supported by an indemnity assumed greater responsibility, resulting in job dissatisfaction [Tadeg H et al, 2014]. As a result, the provision of pharmaceutical services will fall short of expectations and will require immediate attention [Teferi G et al, 2016]. The results, on the other hand, suggest that pharmacy staff value their jobs and are able to improve the working environment with their coworkers.

The availability of medications is the most important factor influencing patient happiness. In this investigation, medication was available in 55% of cases. The findings were not comparable to the APTS-implemented public hospitals in GamoGofa where 85 percent of patients were enrolled. [Carmichael JM et al, 2017], Dessie referral hospital (84%) [Kasahun Bogale .., et al 2021], and Amanueal mental hospital (84%) [Alemayehu Y, et al, 2017] of the patients reported that prescribed drugs were available. TASH has a 63.33 percent availability of important tracer medicines, which is lower than studies that found increased availability of essential tracer drugs in APTS sites than in non-APTS sites (90% vs. 70%) [Teferi G et al, 2016]. And 83.1% and 72.0% in APTS and non-APTS hospital stores, respectively [BeyeneD.,et al 2016]. However, many explanations for the scarcity of vital drugs have been discovered. Poor medicine supply and distribution networks, insufficient health staff, a limited budget, as well as the high expense of medicine. [Menebo MM, 2014].

One of the eight critical parts of primary health care is important medications, according to the World Health Organization, since they have high value in health care systems and often make a difference in individual and population health outcomes. Increased out-of-pocket expenses result from a lack of access to medicine, putting households at risk of financial ruin. As a result, medicine is out of reach for the majority of the world's population of 50. As a result, a steady supply of safe, effective, and high-quality drugs at a fair price is important to the success of health-care package application. program implementation [Menebo MM, 2014]. This is a critical issue that health administrators should address, and necessary actions should be adopted.

One of the simplest jobs for the pharmacy section to increase patient adherence to prescribed regimens is labeling. Because clients may forget essential information after leaving the pharmacy, enough labeling information should be provided to reinforce the counseling service offered. Exit interviews with 200 hospital patients who had received medications from the outpatient pharmacy were undertaken. By selecting one of the drugs at random, the labeling information on the package was examined.

The most common information recorded on the labels was the medicine's name and frequency, with a frequency of 74.1% and 68.4%, respectively. It's possible that this is due to the manufacturer's printing of the product's name. Evaluations in Ethiopia as of 2003 indicate that, on average, only 19.9% of drugs distributed to patients by medical institutions are properly labeled (FMOH, 2003). This difference may be because Ethiopia is not implementing APTS at the time. Ethiopian pharmacy/pharmaceutical retail store drug labels do not meet requirements and/or standards. Dispensed medications are often seen to have no

label, incomplete label, or illegible label (FMOH, 2018). Since pharmacists are the last healthcare professionals to encounter patients or families before they take their medications, they must provide enough drug information to ensure that patients take their medications correctly. Because inadequate therapy information could lead to non-adherence and, as a result, undesirable medication effects.

In this assessment, the labeling does not provide the quantity of medication or the duration of the medication (68.9% and 69.3%, respectively). That is 31.1% of medication and 30.7% of the duration of dispensed drugs labeled correctly. These percentages are below the WHO's recommended level (100 percent). The patient's name, treatment regimen, and drug dose should all be included on each medicine label (WHO, 1993). The low value could be due to a lack of packaging for labeling, a lack of markers, the attitude of dispensers, or a high patient load. Even in countries with improved labeling policies, studies reveal that barely 50% of medications are taken as prescribed. As a result, countries with inadequate labeling practices face a greater challenge. The study value is lower than reported in Eastern Ethiopia (64%) [Mekonnen S. et al 2017], Southwest Ethiopia (70%) [Mulugeta T. et al, 2011], but higher than the studies in Bole Hora hospital, Southern Ethiopia (12.3%) [Andinet H., et al, 2015], Tanzania (20.1%) [Mekonnen S. et al 2017].

Because the results for label appropriateness are so poor, patients' knowledge of the length of use is expected to be low. However, in this study, patients' knowledge of the duration of use was 70%. Because patients have to come back and go to the next appointment. The evaluation of the implementation of APTS by FMOH and the USAID/SIAPS cooperation project showed that: The patients' knowledge of how to take

medications; regarding the dose, route of administration, frequency and duration, only 50.5% of clients correctly understand all the parameters (FMOH and USAID, 2014). However, in this evaluation, it was found that 83.87% of the patients knew how to take the drug parameters related to these parameters. As Terry et al. (2010), Patients who grasp the seven WHO drug use indications are able to understand how to take given medications, according to a study conducted in Afghanistan (name, dose, route of administration, frequency, duration), preventive measures, and storage range from less than 10% to 60%.

The levels of patient satisfaction with the service provided at TASH are different at different pharmacy service sites, according to this study. It also showed that only 131 people (65.5 percent) were dissatisfied with the availability of certain drugs, whereas studies conducted in Nigeria show that 56 percent are dissatisfied [Ofli An. et al, 2005]. This demonstrates that there is a problem with budget utilization.

In the present study, 168 TASH respondents (83.8 percent) understood what the pharmaceutical service providers told them. This shows that it is comparable to Sudanese research, which indicated that 82 percent of respondents understood what pharmaceutical service providers instructed. According to the findings of this TASH study, 131 (65.5%) of respondents were dissatisfied with the availability of prescribed medications in hospitals. A study conducted at Jimma University Specialized Hospitals found that 70% of clients were dissatisfied with the availability of prescribed drugs in the hospital pharmacy [Assefa F. et al, 2011]. This could be because the APTS system was implemented, which improved the appropriate distribution and availability of prescribed pharmaceuticals in hospitals.

According to the findings, 85 (42.5%) of TASH respondents were satisfied with the amount of time spent with them by pharmacy staff in delivering proper prescription information. Only 9.2 % and 48.3% of respondents in a research conducted at Gonder university referral hospitals and Hiwotfana specialized university hospitals were happy with the quantity of time spent with pharmacy specialists respectively. [Surur S.et al, 2015]. In this case, the finding is much better than Gonder (9.2%) but less than Hiwotfana (48%), [Yohanes R.et al, 2017]. And this could be owing to the pharmacists' differing approaches to the responders. Human resource shortages, high workload, attrition, lack of indemnity policy, insufficient salary, lack of training, lack of steady financial audits, and workload were all identified as important difficulties for APTS in the current study. These factors were already identified by studies conducted previously [Menebo MM, 2014]. In addition, APTS implementation was hampered by a lack of adequate equipment and facilities, a failure to use the pharmacy's most efficient mix of service units [Ayalew A et al, 2012], a budget limitation [Gebremariam ET.et al,2019], a lack of supervision, and patient variables [Menebo MM, 2014]. Given that, APTS enhanced service quality, medication availability, medicine budget utilization, and waste reduction.

Measuring the impact of APTS deployment on health institutions was aid health administrators and decision-makers in their efforts to improve pharmacy service quality. The findings are also critical for the ministry of health to develop and implement plans for logical and efficient pharmaceutical services. The current study had certain drawbacks. The study's cross-sectional design made it impossible to determine a temporal association. Because

respondents were asked to reply based on their own experiences, social desirability bias could alter the study's conclusions.

6. SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

6.1 Summary of major findings

- TASH has a 63.33 % availability of critical tracer medications in the medical store, compared to 55 % in the dispensary. The maximum stock-out period for some vital medications was 150 days (5 months) and 65.5% of patients were dissatisfied with the availability of prescribed medications in hospitals. More than half of pharmacists agree that APTS has not improved the availability of medicines and not reduced the waiting time for patients' treatment.
- There is still a gap in the need for pharmacists. The satisfaction of pharmacy professionals was low, with more than 56.1% of pharmacists disagreeing or strongly disagreeing. More than 50% of pharmacists were satisfied with most of the key outcome measures. Overall, 56.1 % of those polled were dissatisfied with their jobs.
- There is a problem with budget use, as shown by considerable patient discontent, limited availability of critical medications, long stock out times, and high waste.
- The finance chief further stated that a discrepancy analysis between the quantities of medicine entered on the bin card and the actual physical count is not done on a regular basis. TASH examines its stock, although not on a regular basis, and the biggest problems were poor SSA analysis and ABC/VEN reconciliation.
- The absence of regular financial audits and the manual recording of a high number of items were recognized as the primary auditing problems.

- TASH had basic APTS equipment on hand, including model 19 and model 22 (modified), cash sales tickets, and dispensing registers. On everyday basis, a financial breakdown for cash sales and allowed medicine distribution was also documented. Patients in the study were satisfied with the convenience of the pharmacy and dispensing area. 65.5% of patients were dissatisfied with the availability of prescribed medications in hospitals. The overall satisfaction rate is 43.1% on average according to the study.
- Human resource shortages, workload, attrition, a lack of indemnification insurance, an inadequate salary, a lack of building capacity, and a lack of frequent budget monitoring, and workload were all identified as important difficulties for APTS in the current study.

6.2 Conclusion

This study revealed TASH has a 63.33% availability of critical tracer medications in the medical store, compared to 55% in the dispensary. More than half of pharmacists disagree that APTS has improved the availability of medicines. However, more than half agree that it has not reduced the waiting time for patients' treatment. More than 50% of pharmacists are satisfied with most of the key APTS outcome measures. Overall, 56.1% of those polled were dissatisfied with their jobs. There is still a gap in the need for pharmacists. There is an issue with budget usage, as evidenced by significant patient dissatisfaction, low availability of key pharmaceuticals, protracted stock out periods, and high wastage. It was also reported by the finance head that discrepancy analysis between the quantities of

medicine recorded on the bin card and the actual physical count is not regularly conducted. TASH examines its stock, although not on a regular basis, and the biggest problems were poor SSA analysis and ABC/VEN reconciliation. The absence of regular financial audits and the manual recording of a high number of items were recognized as the primary auditing problems. TASH had basic APTS equipment on hand, including model 19 and model 22 (modified), cash sales tickets, and dispensing registers. A financial summary for cash transactions and free medication delivery is provided daily. Patients in the study were satisfied with the convenience of the pharmacy and dispensing area. 65.5% of patients were dissatisfied with the availability of prescribed medications in hospitals. The overall satisfaction rate is 43.1% on average according to the study. Manpower shortage, workload, attrition, lack of indemnification insurance, inadequate compensation, lack of training, and infrequent financial audits, and workload were all identified as important difficulties for APTS in the current study.

6.3 Recommendations

- Based on the work load analysis, staffs have to be adjusted as soon as possible. Furthermore, determining staff size should be viewed as a continuous process that is based on the workload of pharmacy employees.
- To make the transaction more transparent, internal auditing should be done on a regular basis.
- Budget allocation, revenue creation, and self-sufficiency in meeting pharmaceutical demands are all issues that need to be addressed by the relevant authorities.

- TASH should replace manual effort with an automated system that makes documenting easier.
- TASH should collaborate with the MOH on the adoption of an indemnity policy.
- To improve pharmaceutical availability, inventory management must be improved by hiring a full-time dedicated clerk so that decisions are based on correct data.
- Hospital administration should improve working conditions and devise financial strategies for pharmacists and pharmacy accountants by establishing community-based pharmacies outside of the hospital

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Appendix

1.1. INFORMED CONSENT FORM

ADDIS ABABA UNIVERSITY SCHOOL OF COMMERCE DEPARTMENT OF ART OF LOGISTICS AND SUPPLY CHAIN MANAGEMEN

Dear respondent,

I am TakeleTessema from Addis Ababa University school of Commerce. Currently, I am pursuing a master's program in Art of logistic and Supply Chain Management. Therefore, I need your cooperation to complete this questionnaire on topic "**assessment on auditable pharmaceutical transaction and service implementation outcomes on pharmaceutical services: the case of Tikur Anbessa Specialized Hospital**". Taking part in this study you will contribute towards alleviating the problem of APTS implementation and contribute for further solutions. Thank you for participating in my research. I would appreciate if you would a few minutes of your time to sign this consent and answer this questionnaire. Your answer from this survey will be used for academic purpose only and your identity will keep strictly confidential. Your time and cooperation is much appreciated. Thank you.

I have been well aware of the fact that this study is fully supported by Addis Ababa university school of commerce and the designated principal investigator is Takele Tessema. I have read this form, or it has been read to me in the language I comprehend and understood the condition stated above, therefore, I am willing and confirm my participation by signing the consent.

Name _____

Signature _____

Date _____

1.2. A Guide for interview with the head of the pharmacy department of the hospital

S.No.	Question	Response
Profile of the respondent		
1	Gender	Male <input type="checkbox"/> Female <input type="checkbox"/>
2	Qualification (check all that apply)	BPharma <input type="checkbox"/> MPharm <input type="checkbox"/> Other(s) (specify) _____
3	How many years of experience do you have working in the field of pharmacy?	_____ years
4	How long have you worked at your current position?	_____ years
5	Have you taken in-service trainings that were helpful for your managerial activities?	Yes <input type="checkbox"/> No <input type="checkbox"/>
6	Does the hospital have a written job description for professionals working in the pharmacy?	Yes <input type="checkbox"/> No <input type="checkbox"/>
Human resources profile of the pharmacy department		
7	How many of the following supporting staff is working under your department? (number)	Cashiers _____ Data clerks/stock card clerks _____ Pharmacy accountants _____ Porters _____ Janitors/cleaners _____ Security guards _____
Pharmaceutical transactions and services of the hospital		
8	Which of the following services are provided in the pharmacy department?	
		Adequacy of Pharmacy personnel Yes <input type="checkbox"/> No <input type="checkbox"/>

	OPD pharmacy		
	Emergency Pharmacy service		
	Inpatient pharmacy service		
	ART pharmacy		
	Clinical pharmacy services		
	Chronic care pharmacy		
	Drug information Service		
	Extemporaneous compounding		
	Other (specify) _____		
9	Have you ever taken training on Auditable Pharmacy Transaction and Services	Yes <input type="checkbox"/>	No <input type="checkbox"/>
10	Was baseline assessment done in your hospital prior to implementation of APTS? (check document)	Yes <input type="checkbox"/>	No <input type="checkbox"/>
11	If yes, what were the major problems identified? Probe: Ask about human resources, infrastructure, workflow, auditability, and transparency of pharmaceutical transactions.		
12	Were there human resource gaps?	Yes <input type="checkbox"/> No <input type="checkbox"/>	
13	If yes, has there been hiring of pharmacy professionals?	Yes <input type="checkbox"/> No <input type="checkbox"/>	
14	Number of newly hired pharmacy professionals	Pharmacists _____ Druggist _____	
15	Number of newly hired other support staffs	Cashiers _____ Data/stock card clerk _____ Pharmacy accountants _____ Porters _____	

		Janitors/cleaners _____ Security/ guards _____
16	Do you think the current human resources in your department are sufficient for APTS implementation?	Yes <input type="checkbox"/> No <input type="checkbox"/>
17	If no, which category/ies of personnel need to be added?	Pharmacist Yes <input type="checkbox"/> NO <input type="checkbox"/> Cashier Yes <input type="checkbox"/> NO <input type="checkbox"/> Stock card clerks Yes <input type="checkbox"/> No <input type="checkbox"/> Accountants Yes <input type="checkbox"/> No <input type="checkbox"/> Porters Yes <input type="checkbox"/> No <input type="checkbox"/> Cleaners Yes <input type="checkbox"/> No <input type="checkbox"/> Guards Yes <input type="checkbox"/> No <input type="checkbox"/>
18	Do you think attrition of pharmacy professionals is a problem in your hospital?	Yes <input type="checkbox"/> No <input type="checkbox"/>
19	If yes, what do you think are the most probable reasons (in order of importance)? First _____ Second _____ Third _____	Probe: Ask about workload, shift system, lack of incentives, inadequate salary, lack of policy on indemnity, shared responsibility
20	Has workload analysis of pharmacy professionals working in the hospital ever been performed? (check document)	Yes <input type="checkbox"/> No <input type="checkbox"/>

21	If yes, for which category?	OPD pharmacy _____ Emergency Pharmacy service _____ Inpatient pharmacy service _____ ART pharmacy _____ Clinical pharmacy services _____ Chronic care pharmacy _____ Drug information Service _____ Extemporaneous compounding _____ Other (specify) _____
22	If yes, what mechanism was followed in the analysis? (check all that apply) No. of counseling patients No. of beds (for clinical) No. of stores No. of other units (DIS, Compounding etc.)	
23	Have new forms like cash sales tickets, registers, new types of model 19 and 22 been introduced?	Yes <input type="checkbox"/> No <input type="checkbox"/>
24	If yes, has their introduction improved traceability of products?	Yes <input type="checkbox"/> No <input type="checkbox"/>
25	Do you conduct a patient care indicator survey (using WHO indicators) at least once a year?	Yes <input type="checkbox"/> No <input type="checkbox"/>
26	Do you conduct a regular patient satisfaction survey? (quarterly)	Yes <input type="checkbox"/> No <input type="checkbox"/>
27	Has APTS been used for performance evaluation	Yes <input type="checkbox"/> No <input type="checkbox"/>

	of staff?	
28	Do you conduct regular assessment of key medicine availability? (quarterly)	Yes <input type="checkbox"/> No <input type="checkbox"/>
29	Is there indemnity insurance/protection for professionals involved in the APTS implementation?	Yes <input type="checkbox"/> No <input type="checkbox"/>
If No, What is the reason for not initiating a protection policy? What problems do you encounter due to the absence of this policy?		
30	Do you undertake APTS implementation and outcome monitoring and evaluation?	Yes <input type="checkbox"/> No <input type="checkbox"/>
31	If yes, how often?	Monthly_____Quarterly_____
32	Do you report the monitoring and evaluation results to the management of the hospital? Yes____No____	
33	Is there supervision by the health bureau on the state of the implementation of APTS?	Yes <input type="checkbox"/> No <input type="checkbox"/>
34	Is there a mechanism for reporting the status of APTS implementation to the health bureau?	Yes <input type="checkbox"/> No <input type="checkbox"/>
35	If yes, which mechanism is used? • Report and feedback • Review meeting and share best experience and challenges	Yes <input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/>
36	Do you regularly receive feedback on your hospital's APTS reports from the health bureau?	Yes <input type="checkbox"/> No <input type="checkbox"/>
37	What were the achievements recorded by the implementing APTS in your hospital?	

38	<p>What are the challenges the department faced in the implementation of APTS?</p> <p>What are the limitations of the system APTS?</p>		
39	<table border="1"> <tr> <td data-bbox="297 388 956 739"> <p>What is your opinion of the overall implementation of APTS in your hospital?</p> </td> <td data-bbox="956 388 1435 739"> <p>Poorly Implemented _____</p> <p>Progressing well to full implementation _____</p> <p>Successfully implemented _____</p> </td> </tr> </table>	<p>What is your opinion of the overall implementation of APTS in your hospital?</p>	<p>Poorly Implemented _____</p> <p>Progressing well to full implementation _____</p> <p>Successfully implemented _____</p>
<p>What is your opinion of the overall implementation of APTS in your hospital?</p>	<p>Poorly Implemented _____</p> <p>Progressing well to full implementation _____</p> <p>Successfully implemented _____</p>		
40	<p>If there is anything you would like to add, your comments are welcome</p>		

1.3. Guide for interview with finance head of the hospital on pharmacy budget utilization and transparent and accountable transactions

1. Background characteristics of the respondent

- Position _____
- Total years of work experience _____
- Total years of work experience at current position _____

2. How do you plan, manage, and control accounting functions of your hospital pharmacy?

3. Which body provides the forms/tools (model 19/1, model 22/1, cash sales tickets, and others) used for APTS implementation? Probe: Ask about the appropriateness of vouchers and sales tickets for gathering the necessary information.

4. How do you ensure that the pharmacy transaction is up-to-date?
Probe: Ask about preparation of accurate monthly reports of pharmaceutical transactions and timely delivery of reports to concerned authorities.

5. Who allocates budget for pharmaceuticals?

- a. MOH
- b. Hospital Management
- c. Hospital/University Board
- d. Others (specify): _____

6. What was the total annual medicines budget of the hospital for the year 2012?

7. Was the pharmaceuticals budget adequate to cover annual needs?

1. Yes
2. No

8. If no to Q 7, for how many months was the budget adequate? _____

9. How do you see pharmacy budget allocation and utilization in your hospital?

10. What are the challenges in terms of financing and accounting functions?

11. What do you recommend to solve the current challenges (if any) of pharmacy financial transactions?

12. Anything you want to add?

1.4. Guide for interview with auditor of the hospital on auditing pharmaceutical services

1. Background characteristics of the respondents

- Position _____
- Total years of work experience _____
- Total years of work experience at current positions _____

2. Have you received training on APTS? If yes, can you please tell me the objectives of APTS?

3. Do you conduct auditing of pharmaceutical transaction in your hospital?

Yes No

Probe: Ask about financial audits, service audits, and sample audits.

4. If yes to Q 3, when was it last audited? _____

5. If yes to Q 3, which of the following auditing practices was/were performed? (you may choose one or more)

- a. Daily summary (sales, shortages, overages, services, etc.)
- b. Monthly reporting (sales, shortages, overages, services, etc.)
- c. Surprise auditing of product and finance
- d. Schedule auditing at least once per year (service, finance, and product)
- e. Regular pharmacy service auditing
- f. Physical inventory at least quarterly and balanced with quarterly financial reports

6. How do you evaluate the availability of organized and complete information on all forms of pharmaceutical transactions while you undertake auditing?

Probe: Ask about vouchers (model 19, model 22, model 20), cash/credit sales tickets, financial reports, physical inventory counts, and updated bin cards and stock cards.

7. If yes, what type of discrepancy was discovered?

8. What are the challenges the department faced in the implementation of APTS?

9. Anything you want to add?

1.5. Self-administered questionnaire for pharmacy professionals working in the hospital

1.5.1. Section I. Socio-demographic Characteristics of Respondents

S.No.	Question/item	Response
1	Gender	Male <input type="checkbox"/> Female <input type="checkbox"/>
2	Marital Status	Single <input type="checkbox"/> Married <input type="checkbox"/> Divorced <input type="checkbox"/> Widowed <input type="checkbox"/>
3	Academic qualification (check all that apply)	Diploma in pharmacy earned <input type="checkbox"/> BPharm <input type="checkbox"/> MPharm <input type="checkbox"/> Other (specify) _____
4	Total number of service years since graduation	_____ years
5	Number of years at current job (in this Hospital)	_____ years
6	Average number of hours that you work per day	_____ hrs
7	Duty hours per month	_____ hrs
8	Do you have access to a written job	Yes <input type="checkbox"/>

	description in your hospital?	No <input type="checkbox"/>
9	Primary practice area?	ART dispensing <input type="checkbox"/> Clinical Pharmacy service <input type="checkbox"/> OPD dispensing <input type="checkbox"/> DSM <input type="checkbox"/> Compounding <input type="checkbox"/> Drug information center <input type="checkbox"/> Store Management <input type="checkbox"/> In patient dispensing <input type="checkbox"/> Administrative activity <input type="checkbox"/> .Other (specify) _____

1.5.2. Section II: Knowledge and perception of pharmacy professionals toward APTS implementation and outcomes

	Have you received training on APTS?	Yes <input type="checkbox"/>	No <input type="checkbox"/>				
Please mark the rating corresponding to your level of agreement based on the following descriptions							
1- Strongly disagree (SD) 2- Disagree (D) 3-Neutral (N) 4-Agree (A) 5-Strongly agree (SA) Not Applicable (NA)							
S.No.	Parameter	SA	A	N	D	SD	NA
1	APTS implementation improved availability of medicines.	5	4	3	2	1	0
2	APTS implementation increased my workload	5	4	3	2	1	0
3	APTS implementation improved job opportunities for pharmacists	5	4	3	2	1	0

4	APTS implementation has reduced expiry of medicines.	5	4	3	2	1	0
5	APTS implementation has reduced theft of medicines.	5	4	3	2	1	0
6	APTS implementation has not helped to reduce damage to medicines	5	4	3	2	1	0
7	APTS has improved transparency of pharmaceutical transactions	5	4	3	2	1	0
8	APTS has improved the record-keeping practices of the pharmacy	5	4	3	2	1	0
9	APTS implementation has improved patient satisfaction	5	4	3	2	1	0
10	Other hospital units like laboratory, nursing and radiology are better satisfied in the service they get from the pharmacy department after the start of APTS	5	4	3	2	1	0
11	Introduction of collective responsibility shared by all pharmacy professionals in a unit improved accountability	5	4	3	2	1	0
12	The assigning of bin locations in dispensaries to pharmacists improved the supply of the medicines	5	4	3	2	1	0
13	The assigning of bin locations in dispensaries to pharmacists improved the security of the medicines	5	4	3	2	1	0
14	APTS has improved forecasting of the medicines needed.	5	4	3	2	1	0
15	APTS has reduced the waiting time of	5	4	3	2	1	0

	patients to get pharmacy services. (Note: initial point of the service is contacting the Rx evaluator.)						
16	After the implementation of APTS, workflow improved.	5	4	3	2	1	0
17	After the implementation of APTS, Rx evaluation improved	5	4	3	2	1	0
18	After the implementation of APTS, medication counseling has improved	5	4	3	2	1	0
19	APTS implementation has increased the attrition rate of pharmacy professionals	5	4	3	2	1	0
20	APTS implementation has improved budget utilization efficiency	5	4	3	2	1	0
21	APTS should be expanded to all health facilities.	5	4	3	2	1	0
22	In general, APTS is a vital initiative to improve pharmacy service	5	4	3	2	1	0

1.5.3. Section III- Questionnaire on job Satisfaction for pharmacy personnel Instruction:

Responses should be collected from all staff in the pharmacy. Fill in numbers 1 to 5 in the box as per the following scale.

S.No	Tick one number for each questions	1	2	3	4	5
		Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Satisfaction with the supervision						

1	The supervisor I work with are supportive					
2	My superior listen to me properly					
3	I am fairly treated by the management of the hospital					
4	My suggestion are usually given consideration by my supervisor					
5	My work responsibilities are made clear by my supervisor					
Satisfaction with the co-workers						
6	I enjoy working with my colleagues in the hospital					
7	The people I work with are responsible for their job					
8	The people I work with give me enough support					
9	The people I work with are cooperative					
Satisfaction with payment						
10	My pay is adequate ,considering the responsibility I have					
11	The hospital pays me fair benefits (transport, house rent...)					
12	There are benefits we don't have that we should have					
Satisfaction with promotion						
13	I like the basis on which the hospital promotes people					

14	Promotion are infrequent in the hospital					
Satisfaction with work itself						
15	My job is interesting					
16	I would rather be doing another job					
17	I feel unappreciated by the hospital for the work I do					
18	I have too much to do at work					
19	I often feel that I don't know what is going on the organization					
20	I feel the sense of pride in doing my job					
21	I don't feel my efforts are rewarded the way they should be					
22	Work assignment are not fully explained					
23	My job makes good use of my skills and abilities					
24	I have a tools and resources to do my job well					
25	My work gives me a feeling of personal accomplishment					
26	Training adequately prepared me for the job					
Premises and Facilities						
27	Sufficient attention is given to my job safety					
28	Premises are convenient for					

	conducting my duties					
29	Facilities are adequate for conducting my duties					
Overall satisfaction						
30	Considering everything ,I am satisfied with my job					

1.6. Check-list for availability and Duration of stock-outs for Key Medicines for medical store

SN	Medicine description	Stock out duration (in days)at store					Remark
		Dispensary		Store			
		Yes	No	Yes	No	Past 3 months	
1	Adrenalin injection						
2	Amoxicillin with or without clavulnicacid						
3	Cefepime injection						
4	Ceftriaxone injection						
5	Cimetidine injection						
6	Ciprofloxacin Injection						
7	Ciprofloxacin tablet						
8	CotrimoxazoleTab/sus						
9	Depo injection						
10	Diclofenac injection						
11	Doxycyclin capsule						
12	Ergometrinmaleatinj/tab						
13	Fefol						

14	Fluconazole tablet/capsul						
15	Glucose 40% solution						
16	Lidocain injection						
17	Mangniaiumsulphateinj						
18	Mebendazole tab						
19	Metronidazole injection						
20	Normal saline solution						
21	ORS						
22	Oxytocine injection						
23	Paracetamol tab/syrup						
24	Pentavalent DPT V						
25	RHZE						
26	Ringer lactate solution						
27	TAT injection						
28	TDF/AZT/3TC/EFV						
29	TTC eye ointment						
30	Vancomycin injection						

1.7. A check-list for accuracy of Records (Matching of Recorded Quantity with Physical Count) at Medical store

S.no	Item description	Store		
		Record	Count	Discrepancy
1	Adrenalin injection			
2	Amoxicillin with or without clavulinicacid			
3	Cefepime injection			
4	Ceftriaxone injection			
5	Cimetidine injection			
6	Ciprofloxacin tablet			
7	Coartem			
8	CotrimoxazoleTab/sus			
9	Depo injection			
10	Diclofenac injection			
11	Doxycyclin capsule			
12	Ergometrinmaleatinj/tab			
13	Fefol			
14	Fluconazole tablet/capsul			
15	Glucose 40% solution			
16	Lidocain injection			
17	Mangniaiumsulphateinj			
18	Mebendazole tab			
19	Metronidazole injection			
20	Normal saline solution			
21	ORS			
22	Oxytocine injection			

23	Paracetamol tab/syrup			
24	Pentavalent DPT V			
25	RHZE			
26	Ringer lactate solution			
27	TAT injection			
28	TDF/AZT/3TC/EFV			
29	TTC eye ointment			
30	Vancomycin injection			

1.8. Review and check-list on quality of Pharmacy Services & Patient Satisfaction with Services

1. Total number of medicines prescribed for the patient _____

2. Number of medicines dispensed per prescription _____

3. Patient's knowledge of medicine(s) dispensed and labeling practice

Answer by writing Yes if correctly answered by the patient, No, if not.

#medication	Customers knowledge of dispensed meds			Route	Labeling information		
	Dose	Frequency	Duration		Medicine name	Frequency	Quantity /duration
1							
2							
3							
4							
5							
6							
7							

1.9. Questionnaires on respondents' satisfaction with pharmaceutical services for patients.

S.No	Tick one number for each questions	1	2	3	4	5
		Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Dispensing Area						
1	The location of the pharmacy is easily accessible					
2	The waiting area is overall clean and comfortable					
3	The dispensing area and counter are convenient for service provision					
Dispensing process						
4	The pharmacy professionals instruction about how to take the medication is clear					
5	The proper storage of your medication was told about your pharmacist					
6	The information of the pharmacist gives you about the expected result of your medication					
7	The promptness of processing prescription medicines					
8	I could get all the prescribed medication in the pharmacy					
Privacy						
9	The privacy of my conversation with the					

	pharmacist kept					
Assistance to patients						
10	The amount of time spends by the pharmacy professional was adequate					
11	The courtesy and respect shown to me by the pharmacy staff					
Others						
12	The cost of medicines in the pharmacy is fair					
13	The amount of time I spend waiting for to get my prescription to be filled is fair					
Overall satisfaction						
14	Considering everything, I am satisfied with the service that was delivered					

6.4 የተገልጋዎች የእርካታ ዳሰሳ መለኪያ ቅፅ

መፍቻ :5) እጅግበጣምጥሩ 4) በጣምጥሩ 3) አይታወቅም 2)
ጥሩአይደለም 1) እጅግ በጣም ጥሩ አይደለም

ተ. ቁ		እጅግ በጣም ጥሩ	በጣም ጥሩ	አይታወቅም	ጥሩ አይደለም	እጅግ በጣም ጥሩ አይደለም
		5	4	3	2	1
1	የመድኃኒት ባለሙያው በአክብሮትና በተገቢው መልኩ አስተናግዶኛል።					
2	የመድኃኒት ባለሙያው በጥሞና ፍላጎቶቹን አድምጦኛል።					
3	የመድኃኒት ባለሙያው መድኃኒቱ ለምን እንደታዘዘ ነግሮኛል።					
4	የመድኃኒት ባለሙያው ልረዳው በምችለው መንገድ ስለመድኃኒቱ አስረድቶኛል።					
5	ስለመድኃኒቱ የመድኃኒት ባለሙያው የሰጠዎት የቃል መመሪያ ግልጽነት					
6	የፋርማሲ ባለሙያው ለጠየቁት ጥያቄዎች የሰጠዎት ምላሽ ተገቢነት።					
7	የአገልግሎት አሰጣጡ የግል ምስጢርን የሚጠብቅ ነበር					
8	የመድኃኒት ቤቱ አጠቃላይ የአገልግሎት ቅልጥፍና፡					
9	የታዘዘልዎን መድኃኒት በመድኃኒት ቤቱ ውስጥ የማግኘት ሁኔታ።					
10	ከመድኃኒት ቤቱ ያገኛቸው መድኃኒቶች ዋጋ አግባብነት።					
11	የፋርማሲ አገልግሎት ለማግኘት የፈጀሶት የጊዜ ገደብ መቆየት።					
12	የፋርማሲ አገልግሎት ለማግኘት የሚጠበቁበት ቦታ ንጽህናና ምቹነት።					
13	ከሌሎች ጤና ተቋማት አገልግሎት መስጫ ቦታዎች አንፃር የመድኃኒት ቤቱ ቅርበት።					
14	በአጠቃላይ የፋርማሲ ክፍል የአገልግሎት አሰጣጥ					