COLLEGE OF MEDICINE AND HEALTH SCIENCES

SCHOOL OF HEALTH SCIENCE

REDUCING LONG WAITING TIME AT OUTPATIENTS DEPARTMENT OF GAHINI DISTRICT HOSPITAL

A DISSERTATION SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR MASTER OF HOSPITAL AND HEALTHCARE ADMINISTRATION (MHA)

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MHA program 2017-2019

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Kigali September 2019

DECLARATION

I Fred RUTAREMARA, I declare that this research project is my own original work, neither presented nor submitted elsewhere by me or other people for academic purposes at any University. Herein submitted in partial fulfillment of the requirements for the College of Medicine and Health Sciences, at the University of Rwanda for the award of degree of Master of Hospital and Healthcare Administration (MHA). I acknowledged other people's work used as external contribution to the research project.

Student's signature……………………………………

Fred RUTAREMARA

Date…………………………..

DEDICATION

I dedicate this dissertation work to my wife, my children, Mrs. Jessica MUREBWAYIRE, relatives, Church prayer groups, colleagues in physiotherapy department of Gahini hospital, friends, and students who assisted me in the process of data collection, which was very difficult and exhausting procedure. Definitely, without support rendered by individuals at all levels the dissertation would have been in vain.

ACKNOWLEDGMENT

ABSTRACT

Introduction: According to the Rwandan Constitution Article 41 as it was revised in 2015 states that health is a human right and all citizens have rights and obligations concerning to health, as well as provision of equitable, accessible and quality health care services is the vision of Rwandan health sector. Patients waiting time is the essential instrument used to measure quality of health services. Therefore, for improving quality health services, health organization managers should put in place concrete strategies to reduce patients' prolonged waiting time to access timely healthcare services at OPD since it is the main gate to the hospital.

Objective of the study: The main objective of the study is to reduce excessive time spent by service seekers at OPD of Gahini district hospital.

Methods: We carried out pre- post intervention study by using adapted timesheet tool for obtaining results for the implementation of reducing patients waiting time at OPD. All categories of OPD staff provided their opinions through brainstorming about identification of potential root causes and suitable strategies to reduce patients' long waiting time at OPD of Gahini hospital.

During pre- post interventions, we selected 140 patients conveniently as sample size for four days each in January and middle July 2019. In post intervention, 70 outpatients recruited as sample size by using convenient sampling technique for evaluating chosen intervention for reducing waiting time with effect of April 2019 to middle July 2019.

Results: The Overall average waiting time spent by outpatients at Gahini hospital was equivalent of 400minutes (6:40 hours) in pre-intervention and reduced to 193min (3:13 hours) in post intervention phase. About 338minutes (85%) of that time consumed by patients while waiting for services and patients spent 62minutes (15%) of that time with healthcare service providers through processing services. Before intervention, doctors' consultation, cashier counter, registration and nurse triage service points counted overall longest average waiting time compared to other units which were 146minutes(37%), 47minutes (12%) , 40minutes (10%) and 35minutes(9%) respectively. The overall average patients waiting time at OPD significantly decreased from 400minutes (100%) to 193 minutes (52%) with P=0.001 tested by paired *t* test.

Key terms: OPD, Gahini hospital, average waiting, process and overall average waiting times

Conclusion: By referring to the baseline findings of the present study, patients spent long waiting time at the three main OPD service points of the hospital. The hospital should continue to implement the current strategies laid down for reducing waiting time because we are still far in comparing with some achieved waiting time at OPDs of other hospitals. Therefore, there is no improved quality service delivery if service seekers at outpatient department could wait excessive hours to receive healthcare services. Again, the researcher calls up concerned organizations to engage in modalities of reducing long waiting time at OPDs since it is the most important tool for measuring the quality of health service delivery.

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LIST OF ABBREVIATIONS

ARV: Antiretroviral

CBHI: Community Based Health Insurance

CBM: Christian Blind Mission

CMS: Church Missionary Society

DAF: Director of Administration and Finance

DG: Director General of the hospital

DH: District Hospital

EAR: Anglican Church of Rwanda

FCTS: First-Come-First-Served

GRC: Gahini Rehabilitation Center

GBV: Gender Based Violence

HCS: Health Centers

HR: Humana Resource

IDPD: International day for Persons with Disabilities

KFH: King Faisal Hospital

LCFS: Last-Come-First- Served

MHA: Master of Hospital and HealthCare Administration

MOH: Ministry of Health

NCDS: Non-Communicable Diseases

NSP: Nurse Scheduling Problem

OPD: Outpatient Department

PT: Process Time

RRO: Public Relations and Communication Officer

PWDS: Persons with Disabilities

QI: Quality Improvement

RCA: Root Cause Analysis

RMH: Rwanda Military Hospital

SPS: Strategic Problem Solving

SPSS: Software Package for Social Sciences

TWT: Total waiting time

UR: University of Rwanda

USA: United States of America

UTHK: University Teaching Hospital of Kigali

WHO: World Health Organization

WT: Waiting Time

Definition of Key Terms

OPD: is defined as the one of the health facility's department from which healthcare consumers receive "diagnoses and/or treatment" without passing overnight in the hospital[1]. But Pandit BAT et al defined OPD as an "ambulatory care center" in which the entire community affiliates get direct needed full package of health services or through referral to the further competent health organizations for their improved health[2].

Waiting time is defined as the amount of time spent by the healthcare service seekers with effect of arrival at outpatient department to the actual time s/he departs at outpatient clinic[3].

Arrival time: is defined as the real time the healthcare service users reaches to the outpatients department looking for healthcare services[4].

Departure time: This refers to the time a client departs at OPD when s/he is treated or not treated, either admitted in the hospital wards or transferred to the more qualified health facility[4].

Service point: This refers to the number of service stations at OPD whereby service seekers have to pass for acquiring a particular healthcare service[4].

CHAPTER ONE: INTRODUCTION

1.1 Background

Gahini District hospital is found in Gahini Sector, Kayonza District of Eastern Province, it is situated in one kilometer uphill on the main road Kigali-Milama border (Uganda) approximately 78 Kilometers from Kigali city square in the capital city of Rwanda. The Anglican Church missionary society (CMS), established the hospital in 1927, it operates as faith based district hospital aided by Anglican Church and government for improving the health of the population within the catchment area and beyond. The healthcare service consumers at Gahini who come from outside the catchment area they are mostly looking for overseas specialist volunteers and health services related for persons with disabilities (PWDs).

Again, the hospital serves a catchment area of 196,424 citizens, supervises seven Health centers, three health posts, three private dispensaries, two private pharmacies in the Kayonza town. The capacity of the hospital totals to 246 beds whereby 46 beds are for admitted PWDs in Gahini Rehabilitation Center. The clients who are seeking for healthcare services at the hospital ere attended by a total number of 169 personnel. Among of them 14 are medical doctors the majority are general practitioners corresponding to 11 doctors, one pediatrics orthopedic surgeon, one anesthesiologist and one general surgeon, the latter two doctors are overseas volunteers under the partnership of CMS and Gahini EAR Diocese, 72 nurses and midwifes ,27 allied health professionals and 37 supporting staff.

Some national Referral hospitals like Rwanda Military Hospital (RMH) and King Faisal Hospital (KFH) refer post-operative patients to our hospital in surgical and physiotherapy departments especially those who underwent surgery for spinal conditions and total hip replacements due to comprehensive rehabilitation services. In addition to that, the hospital offers healthcare services to admitted and outpatient clients in different units such as: Outpatient and Emergency, Gynecology and Obstetrics, Neonatology, Pediatrics, Antiretroviral (ARV), Gender Based-Violence (GBV), Mental Health, Ophthalmology, Physiotherapy, Stomatology, Internal medicine, Surgery and theatre, Laboratory, Medical imaging, Pharmacy, Prosthesis and Orthosis, administration among others. Gahini district hospital has an additional service which is different from other many district health facilities in Rwanda among of those are outreach program,

children and youth orthopedic consultancy, general surgery and fabrication of orthopedic appliances for PWDs.

The Hospital's vision is to promote health of the population throughout different health services in Kayonza district. The mission is to offer preventive, promotional and curative services of high quality in general, with special attention to persons with disabilities. In year, 2017 International day for person with disabilities (IDPD) in Rwanda was cerebrated at Gahini hospital/Gahini because of its specialty to caring for PWDs. The hospital's rehabilitation center (G R C) in collaboration with Anglican Church of Rwanda Gahini Diocese, CBM international and Ministry of Health in Rwanda they are suggesting to make GRC the National Referral Center for PWDs in Rwanda.

The unit of the study interest in the setting is outpatients' department of Gahini district hospital is consist of different service points. Including four consultation rooms, one reception desk, one cashier counter, room for nurse taking vital signs, CBHI agent, recovery hall, open space roofed shade where patients wait to be attended to by health care providers of different OPD service points, the office of director of nursing, washing rooms for staff and patients. The OPD of the hospital serves an average of 70 clients per day in weekdays and orthopedic surgeon consults averagely 30 youth patients with physical impairments every Saturday for three weeks per month. Four nurses, clinical director, director of nursing, one NCDs clinician, six doctors out of nine doctors who do shifts at OPD depending on the duty roster, three receptionists, one CBHI agent, three cashiers who alternate on day and night shifts, three nurses at the dispensing pharmacy is the key hospital team that attends to patients who visit OPD. Laboratory and medical imaging technicians they work hand in hand with consultation and NCDs services of OPD for diagnosis tests that is why were included to the OPD healthcare providers.

1.1.1 OPD patients' flow process

In general, outpatient department of Gahini hospital operates five days a week from Monday to Friday. Like other district hospitals in Rwanda, all OPD service stations at Gahini hospital must start to serve patients at 7am and close at 5pm but they may work for extra hours if necessary. All Walk-in patients and patients with appointment follow the same process; patients insured by

community-based health insurance they go to CBHI agent after photocopying documents for checking eligibility. The patients who are eligible they continue to the reception desk while illegible ones go back home or they may decide to have needed health services and pay cash 100%. Those with other types of medical insurance start from registration desk and they escape prior two service points. After registration, the patients who need doctors' consultation they must pass at nurses' service station first before seen by physician. The outpatients, who do not necessitate doctors' consultation, go to NCDs consultation and other departments like ophthalmology, stomatology among others. DCDs and doctors' consultations either request diagnostic tests (laboratory and medical imaging) or prescribe medications to patients. Service users after receiving services in the previously stipulated two consultation ODP service units they go to cashier counter service station for payment. Patients sent for the diagnostic tests after receiving results they take them to the respective consultation rooms to decide for treatment, admission, discharge with/without follow-up or referral to the most appropriate healthcare facility. Patients after paying for medical supplies at cashier counter; they continue to wait for supplies dispensing at pharmacy. The latter two service stations are the most common last OPD service units where patients depart for their residences. The above-described patients' process phenomena at OPD of Gahini hospital is on the OPD patients' flow chart below.
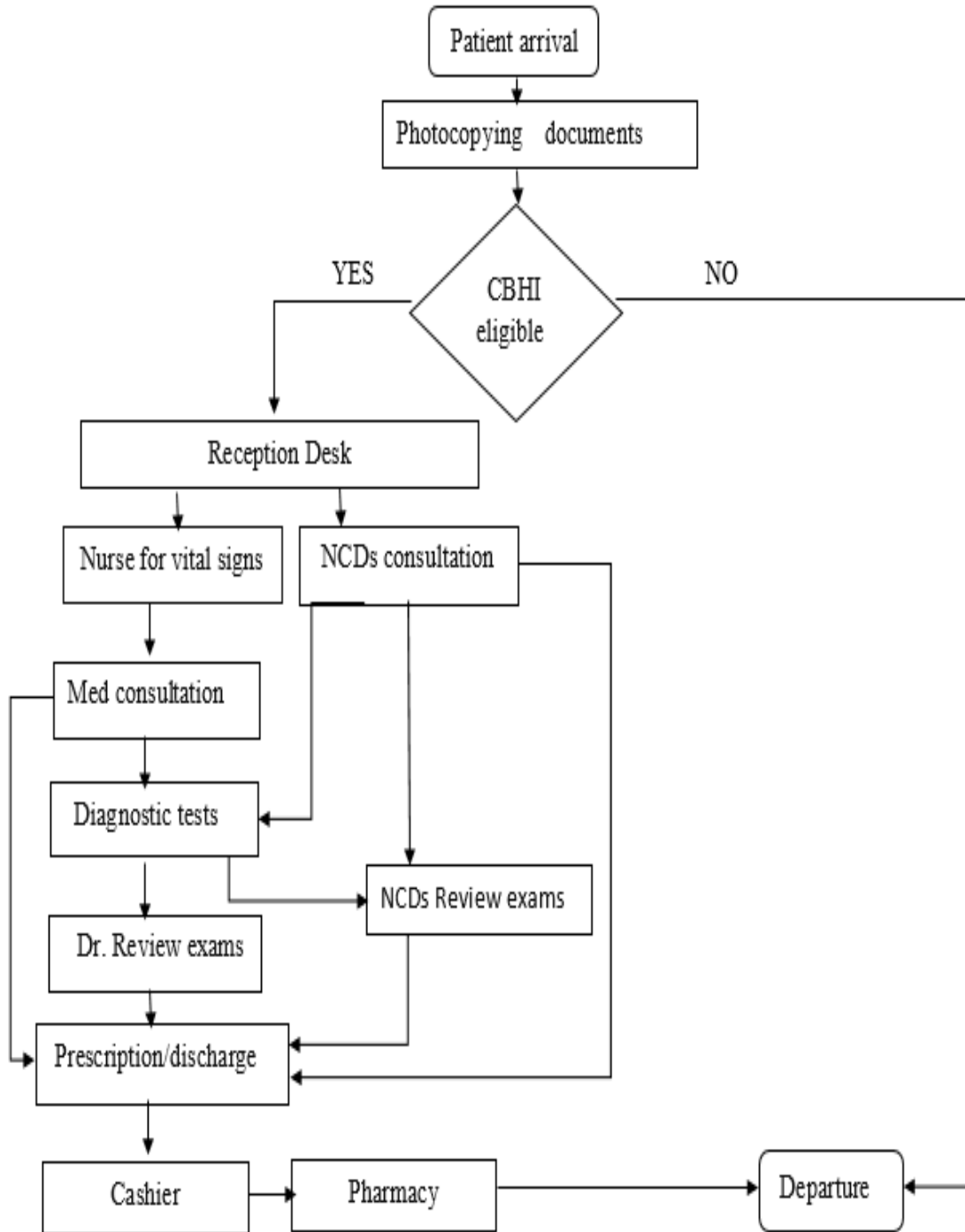
Figure 1: Patients' flow chart at OPD of Gahini District Hospital

1.1.2 Introduction

The world health organization (WHO) identified patient waiting time for healthcare services among of the other "key measurements of a responsive health system" [1]. The ability of timely provided care and reduced harmful delays was one out of six principles guiding the United States (US) Institute of Medicine to take a lead in a "more competitive healthcare delivery system"[1]. According to Ahmad BA et al 2017, stated that service users who seek for primary healthcare must wait for doctor's consultation but no recommended standard set time for waiting or consultation time[5]. The same study showed that if patients wait within 30 minutes probably, they might not discontent with service delivery. Findings of surveys conducted in developed countries reported that patients are willing to wait for doctors' consultation in a range of 30 to 45 minutes[5].

Stretched delays in receiving healthcare services commonly termed as "wait times" or "wait listing," possibly affects the end results of patients' services delivery due to taking long time for diagnosing diseases , poor treatment and appointments[6]. A study carried out at one of Kenyan hospital by Rebecca Bisanju Wafula discovered that unnecessary long waiting time in outpatient department in less resourceful nations is an endless challenge for both healthcare service users and healthcare providers in different hospitals[7]. Another research done in India observed that extended waiting times result into poor quality of service delivery including patients' noncompliance to the treatment, patients follow-up neglected and provided services are non-based practice diagnosis and/or treatment[8]. The similar author reported that total time patients complete in the health facility while looking for health services is the chief influence to the patients' "attitude in respect of expected medical care, time is something of the greatest valued stuff to any humankind".

1.2 Problem statement

"There is long patient waiting time at outpatient department of Gahini District Hospital". Repeated patients' complaints from suggestion boxes at outpatients' department about patients long waiting time instigated the researcher to conduct the current study at OPD of Gahini district hospital. There are very few studies carried out in Rwanda about patients long waiting time at OPDs of different district hospitals in though it is the crucial gage used to measure the quality of healthcare system at all levels of healthcare facilities in each country.

In 2014, a survey carried out in Nigeria about causes of prolonged waiting in Nigerian public health facilities indicated that patients long waiting time is becoming the utmost challenging issue in those health settings for both healthcare service users and healthcare workforces in that Country[9]. Patients' condition may become very severe as result of long waiting time that necessitates healthcare provided by the physician; it is an obligation for health institutions to deliver untouchable medical care to all clients. Moreover, decreased patients long waiting time approved to be the best essential instrument for increasing quality of care among service consumers in the health facilities[10]. A study conducted in South Africa at Western Cape revealed that one of challenges that disturbs quality of healthcare service provision is patients long waiting time for services; this is a serious damage to the "image of public health care sector" and so far no measures put in place to overcome that long-lasting problem[11]. Health industry is facing many challenges either locally or globally among of those problems include; shortage and or unskilled personnel, difficulties in filing medical records, staff or patients not respecting planned schedules and long queue or patients overcrowding. The two later issues causes customers to wait long time till they are called at each service point of OPD [12] .

1.3 The study objective

The overall objective of the current study is to reduce long waiting time at OPD of Gahini DH from **6: 40**hours to **3:30**hours from April 2019 to the middle of July 2019

1.4 Hypothesis

H$_0$: This hypothesis suggests that training of OPD healthcare workforces on time management will not reduce long waiting time at the OPD of Gahini district hospital.
H$_1$: This hypothesis suggests that training of OPD healthcare workforces on time management will reduce long waiting time at the OPD of Gahini district hospital.

1.5 Justification or significances of the study

The current study was officially conducted at the premises of Gahini district hospital with go ahead from management committee. The researcher gave precise and brief explanations in both management and general staff meetings, why and how the implementation of the project will be important to overcome the problem of patients' long waiting time at OPD. The hospital

management team accepted the present quality improvement project since waiting time is one of important indicators of quality assurance for patients care and abide by accreditation system as prerequisite of the hospitals by Ministry of Health in Rwanda to achieve any level. Therefore, after discussing with staff, reducing patients' long waiting time at OPD took priority for improving quality of patients' care at Gahini district hospital. Again, literature mentioned numerous significances of resolving the problem of long waiting time at OPD, such significances include: Primarily, the study will display the data about mean patients waiting time and related issues to the administrators and healthcare service providers of Gahini hospital, which will positively affect quality of service provision[7]. Reducing the unnecessary amount of time patients spend while seeking for OPD services will results into good quality service delivery, patients satisfaction , reduces staff frustrations or stress , increases staff motivation , improves hospitals' cost- effectiveness and reputation [6]. Therefore, reducing the issue of prolonged patient waiting time at OPD, Gahini district hospital will benefit from accomplishing its mission and vision effectively. Subsequently, outpatients who visit Gahini hospital will have good functional accessibility to the healthcare services. Thus, yielding utmost prerequisite outcomes of Gahini hospital such as securing accreditation standards and improved financial sustainability. Ability to reduce the duration spent by clients to get healthcare services together with "right care at right time" service users will benefit positively on quality of service provided, hence patients will have improved outcomes with minimized cost of care [14]. Well-selected project implementation strategies would help the hospital to reduce issues of patients long waiting while with or without using a lot of resources to overcome the identified problems[15].

1.6 Organization of the dissertation

This part of the capstone serves to highlights, organizes and summaries three components of the study. The first part is the preliminary pages made up of title page up to the list of abbreviations, the second component, is comprises of six chapters which are the major areas of the study, the third and last part consists of references and appendixes. Chapter 1 was the introduction that presents the study setting and background issues related to the project. Literature review is chapter two that gives related matters about similar studies carried out worldwide. Methodology was the third chapter and focuses mainly on-applied processes, procedures, methods and techniques to deliver an effective project report. The sub-content of it were root causes analysis,

study design, sampling techniques, root causes and interventions taken to reduce the problem to mention but a few.

Results presentation was the fourth chapter of the project, which indicates results of the project implementation, findings of each variable and any statistical test used during the study. Chapter 5 is all about discussions based on the results obtained, this chapter indicates successfulness or failure of intervention, limitations and challenges uncounted, experiences and skills gained and foresee to improve the project implementation. The last chapter but not the least is chapter six concerned with conclusion and recommendations, this part constitutes of about observations stated the in discussion that should be tackled by the MOH, the study setting and other researchers. References show the relevant literatures cited by the researcher while conducting the study and appendix tells the tools used to gather the data during pre-post intervention of the research project.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

Patient long waiting time is considered as one of the major factors contributing to inaccessibility of quality healthcare service delivery among health facilities in Rwanda, a survey done at University Teaching Hospital of Kigali (UTHK) service consumers reported length of time to be attended by healthcare workers [16]. Abid Hussain et al in 2019 stated that the duration of time patients complete in the healthcare facilities while seeking for health services considered to be very important[17]. Reflecting on that study carried out at UTHK many studies in Rwanda regarding waiting time would help to know its magnitude and associated factors that hinder patients to access quality of healthcare services delivery especially at outpatients' service stations(16). The researcher of the current study collected information by interviewing healthcare providers at seven out of eight hospitals in Eastern Province and One hospital in Northern Province of Rwanda, in order to know if long waiting time is a common problem at OPDs of hospitals in the Eastern Province of Rwanda. The information provided by healthcare workforces at the above-mentioned hospitals reported that excessive time spent by patients at OPD is the greatest frequent problem in their healthcare settings. Staff interviewed at those hospitals report indicated that doctor' consultation, registration desk, laboratory, cahier desk and pharmacy OPD service stations were the most common areas where outpatients take long time to receive healthcare services. Insufficient healthcare professionals, inefficiency of managers in organizing health facilities, logistical matters and demotivated staff were the causes of patients' long waiting time reported by staff at OPD service stations of seven hospitals Eastern province and one hospital in Northern Province of Rwanda.

A study conducted by Sanjeev SINGH et al in a year 2013, cited that waiting time at every OPD service section is a common problem for almost to each and every individual seeking for medical care. Patients may delay for registration, physicians' appointment, management of clients at emergency chambers, investigating units (medical imaging, laboratory), procedures, obtaining results of diagnostic tests among others[18] . A study conducted in Vietnam mentioned that patients waiting time is significantly the fundamental index used for examining the standard of healthcare services provided to the service consumers' satisfaction in comparisons with quality of healthcare services [1]. Genuinely, Melesse Belayneh et al 2017 said that skills of

patients waiting time are "perceived as complex, subjective and culturally influenced". In the similar research project revealed that most causes of patients long waiting time include time consumed on registration desk, clearing bills ,finding medical records, time taken for vital signs, inadequate workforce and service processing, however, studies related to waiting time are not valued since they are on small scale[19]. The time clients spend to be attended by healthcare providers is not only the key gage to measure the level of healthcare services provided but also to determine the exact duration required by service consumers to access recommended services at outpatients department[20]. Both patients and healthcare settings acquire losses due to delay for delivering healthcare services such losses include unnecessary costs for clients to pay overnights and transport, patients dissatisfaction, adverse outcomes, poor reputation of the health facilities to mention but a few[20].

Worldwide, the duration needed for patients to wait for services at a health facility would differ within the same healthcare setting or from a country to another country may be due to high workload, caring for emergency conditions, non-outpatients management processes and without forgetting the capacity of the healthcare settings[5]. A study carried out at outpatients department in one of hospitals in Singapore revealed that average total waiting time for service consumers is 2 hours with overcrowding of service seekers arrival time ranging from 7 to 8 AM [12]. The main causative element the survey quoted for prolonged service provision at outpatients department was the "imbalance of the amount of patients in each period"[11]. In 2014, O'Neill C et al the conducted a study in Nigeria about causes of long waiting time in public health settings, where they reported that inability of healthcare service users to access timely quality of service was major challenging factor in healthcare system in that country[6]. In the similar study, they stated that the problem of long waiting time to access healthcare services released time to time be it "after-hours, nights and weekends". The same study continued to express patients long waiting time in public health care settings as serious problem that negatively impact both residents of their country and healthcare service providers.

Historically around the world, it is believed that without effective health care system patient experiences jointly untimely service delivery and inconvenient access to healthcare services[1]. Furthermore, for improving patients' satisfaction, public tertiary hospitals in Republic of China implemented and approved a number of strategic solutions for minimizing long waiting time,

nevertheless the results showed that the highest proportion of them were wrongly "documented and forceful approaches   used with irregular assessment of outcomes"[1]. Shahzadi S and Annayat S in their study of 2017, cited that the respondents in their research recommended that availing healthcare service providers at OPD service station was the best poinion for reducing patients long waiting time at Allied hospital Faisalabad[20]. According to a survey conducted by Rathnayaka Mudiyanselage et al 2012, on "a roster system for nurses" cited that with proper analysis of basic constrain during staff scheduling is crucial in answering constrain dissatisfaction like nurse scheduling problems(NSP)[21]. Such constrain are categorized into hard and soft constrains, examples of hard constrain include staff workload (staff needed), skills and levels, staff requests, expected and unexpected leaves, break hours, shortly surprising requirements, limits within or among staff, considering patterns among others. However, soft constrain must be fulfilled as much as possible, examples of soft constrain are requirements from healthcare providers and patients, "balancing the workload among personnel", working time, weekend work, night shift to mention but a few[21].

2.2 Outpatient department and waiting time

The main gate for the majority of the healthcare service seekers in a health facility is the Outpatient department; likewise, patients' attitudes toward the healthcare setting commences at outpatient department[21]. Frequently, patients' attitude toward service delivery are absolutely affects service consumers' feeling about the health organization while providing healthcare services, in that regard outpatient department stations should deliver outstanding based practice services to their customers[1]. Still more waiting time as an essential tool for measuring quality of service delivery at the OPDs of various hospitals several authors talked about waiting time and its related matters for example. According to Melesse Belayneh et al 2017, defined patients waiting time as entire amount of time a patient spend at the hospital since s /he arrives on registration desk to the time is seen by the physician[19]. Patients waiting time is defined as "The total time a service seeker completes in healthcare setting by the time s/he arrives in the outpatient department to exact time the client departs from the outpatients[10]. In the above-mentioned survey, realized that healthcare service consumers at OPD in the health facility commonly they stay long time while waiting for medical consultation or associated information from specialized healthcare attendants. Patients long waiting time in the outpatient department of

healthcare settings was cited by many researchers as the chief causes of healthcare service users' dissatisfaction, this tarnishes the quality of care provided to service users whereby they may be less or not interested at all to purchase available goods and services by the healthcare facility[13,15,16]. David Speed and Stephen Bornstein 2016, described, "Wait time or wait listing" as prolonged delays for healthcare service users to access quality health care services and would affect the intended patient health outcomes due to delays in diagnosis, treatment or follow-up purposes[3]. These are more obvious in inefficiencies health system results into decreased cost-effectiveness in the health sector, for example the reducing patient wait times in the health system throughout Canada is priority in order to improve or maintain of efficiency or cost-effectiveness in the health system[3]. Again, recent studies done in outpatient departments of healthcare institutions in Africa indicated that until now "long waiting time is a still an issue for the healthcare suppliers and patients"[16].

 A study carried out in Uganda at Mulago Hospital by Musinguzi C in the year 2015 briefly explained some of the key term used in patient waiting time surveys:
 Service time/process time: Defined the service time as the quantity of time a service user complete in physical contact with healthcare service providers at a service point[24].
 Waiting time: This is the amount of time consumed by service seekers while waiting healthcare professionals to provide service[23].
 Overall waiting time: Referred to the totality for both service and waiting times[24].
 Outpatient: Defined as non-admitted person by the hospital like hospitalized healthcare service consumers, but documented in the hospital as an outpatient and provided both supplies and services by the healthcare facility [24].

2.3 Time management
Meriam Mamabolo 2011, defined time management as a method whereby time is planned, organized, exploited and life-threatening in healthcare services[25]. In good time management healthcare service managers anticipate nurses to finish completely her/his duties and responsibilities in timely and cost-effective way, otherwise ineffective utilization of time result into poor quality patients' care[25]. According to Nayak Shaline G in 2018, cited that training nurse students on time management is very crucial for preparing them to have extraordinary

ability for managing expected emergencies during school lifetime and in professional practice at healthcare settings[21]. A study conducted by Stock Armin 2010, reported that time management training courses at work places they are used commonly for improving "more control over time"[22]. However, the same researcher cited that currently there are insufficient intervention studies conducted to assess the impact of time management training programs on career development and productivity[22].

A study carried out in public parastatals in Kenya stated that time in business is equivalent of productivity and as well as productivity equals money[21]. The same study discovered that the institutions, which practice routine training of its workforces "in time management, are high in productivity". It was confirmed that due to practicing time management in private sector has good performance when compared to the their corresponding public parastatals and witnessed by increased calls for privatization of many public institutions in Kenya[21]. "Time management" referred to as "prioritizing and planning" everyday duties and responsibilities[22]. The researchers carried survey in Iran on time management among healthcare managers said that time management has very crucial effects to individual and organizations"[22].

Time management facilitates health professionals to use time in organizing and prioritizing the patients care activities, which is significant for providing quality of care[21]. The same author stated that they are various benefits in "good time management" such as getting maximum output, minimum stress, improved efficiency, extra chances for professional development and employment opportunities in order to accomplish lifetime set objectives[23]. Several factors could contribute to time wasting in service activities for instance, lack of strategic plans, lack of daily work plan, without setting priorities, looking for lost things, unnecessary time on telephone, visiting different websites (surfing) and disorderly of service providers[23].

2.4 Some reported findings at OPDs

Singh PS et al by the year of 2013, they conducted study in India stated that frequently patients long waiting time scores the highest point as " frustrating parts about healthcare service delivery system"(18). A study carried out at UTHK in Rwanda revealed waiting time results as follow; to begin with, out of 365 clients who participated in the study about 69% of them arrived before

8: 00am and 30% entered in registration chamber after 8.00am. However, only 17% out of 69% received consultation at 9:00am while 52% accessed services after 9:00 a.m. Furthermore, 16% of 30% patients who arrived after 8:00am they waited for an hour without consultation likewise the rest 13% given healthcare after another hour. The similar survey continued to show that for the whole study population of 365 service users at OPD of UTHK , 11% of patients left for their homes from 10:00 am-12:00pm , 36%   started to return home from 12:00pm -5:00pm unfortunately till 5:00pm 52% customers were still waiting to be attended[16].

Another study conducted in Uganda with sample size of 401 patients in OPD, pinpointed that above 50% of them delayed around 5.9 hours those who delayed less was 4hrs whereas OPD service seekers who waited stretched to 7hrs [20]. By the same researcher over 39.5% of medical care service users in outpatients' department of Mulago hospital experienced long waiting time at least four hours. Consequently, that long waiting time raised the proportion of healthcare service seekers who left OPD service stations without consultation by physician. The similar investigator reported that 46% of clients left without consultation by medical doctors while were in need of critical medical care, within a week 11% admitted, again, within a week 60% "sought for other medical care". Bad enough among those healthcare service seekers who left OPD without doctors' consultation almost a half of them reported back with aggravated health conditions [20]. So importantly, we able reduce patients' long waiting time at OPD by through quality improvement studies for instance. A study conducted by Yangchen Dolma et al in year 2017 with aim of reducing waiting time by 50% for outpatients needed minor procedures in eye casualty indicated that within two months were able to reduce overall average waiting time with a baseline of 303minutes to 108 minutes[13].

2.5 Common reasons that cause long waiting time at OPDs

Outpatients' dissatisfaction about healthcare services delivery because of long waiting time at the OPDs of healthcare settings is a common theme among many studies carried out in African countries and the entire world[11]. The same study about waiting time conducted in South Africa (SA) contributed to the most determinants of long waiting time in our continent and worldwide which include the following:

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To begin with physical inaccessibility to the health facility and transportation issues, limited operational budget for availing services and supplies at the healthcare facility, insufficient infrastructure was among of causes long waiting time at OPDs. Incompetence of health facility managers for controlling and organizing services noted as the root cause of patients long waiting time at OPDs, Shortage of health workforce and "poor staffing schedules" were also identified [11]. Yavad R et al 2017, stated that inadequate manpower in the hospitals is a factor contributing to the long waiting time at OPD [25].

In a study carried out in SA, patients observed that extraordinary number of healthcare service consumers compared to service providers causes antagonism and frustration within healthcare provers themselves, which result into impoliteness and poor service delivery[11]. A study conducted by Shahzadi S and Annayat S in 2017 at OPD of allied hospital they ranked causes of waiting time at OPD service points. Findings showed that patients' registration procedure took a lead, followed by insufficient number of physicians and inadequate experienced health professionals acquired. That the fourth position was deficiency of models for providing timely OPD services, for example lack of electronic appointment system the fifth, the sixth was the absence of queuing theory and lack of process model like FCFS model who first come first served [20].

2.6 OPD service stations where patients delay mostly

Different studied consulted for the literature exposed that the time patients spend while waiting to receive for healthcare services varies from one OPD service unit to another. For instance, areas like registration desk, doctors' consultation section for diagnosing diseases and prescribing treatment, dispensing pharmacies and cashier counter are the greatest much time-consuming OPD service points than others[6,8] .

2.7 The impact of long waiting time to service users

The respondents in studies carried in South Africa by Tana VV and in Nigeria by O Neill et al they mentioned that patients long waiting time affect negatively quality of healthcare services in one way or the other [6,8]. Among the negative impacts to the service seekers include; patients non-adherence to the prescribed treatment, service consumers develop poor attitude towards

service delivery , patients frustration and anger, raised clients' tension , and increased calamities of adverse medical reactions because of insufficient health education regarding drug effects [6,8].

CHAPTER THREE: METHODOLOGY

This chapter explains the way in which the study conducted measures and practices used for accomplishing the set objective of the study project.

3.1 The study design

A pre-post intervention study design carried out at Gahini DH in OPD for a period of 8 clinical working days from 8th to 11 January and 23rd to 26th July 2019, for measuring overall average, average time patients spent to receive services and average time consumed a patient when in hands of professionals at each service point of OPD. The study design was purposely for evaluating the effect of the intervention during project implementation. In entire period of the study, the researcher formed a joint team of staff and students who helped in data collection for determining magnitude of the problem even in project implementation. We used the obtained data in pre intervention phase as the baseline data. The healthcare providers in the project team were more importantly in root cause analysis, designing interventions, and in project implementation. The team started to implement the intervention of the project with effect of April to middle July 2019 whereas the post intervention assessment carried out in third week of July within the same year. In addition to that, the researcher and assistants conducted a pilot study for one day on two patients for testing the data collection tool and for research assistants to gain experience before applying the tool in the study. The student carried out a one-day training for fifteen secondary and university students who were in holidays as research assistants for supporting the researcher in data collection within eight clinical working days.

3.2 Magnitude of the problem

The current study used adapted patients' time sheet to collect date and baseline findings indicated that the overall average waiting time at OPD of Gahini DH was equivalent of **6:40** hours (400 minutes) as magnitude of the problem. Before intervention findings obtained through evaluating the existing situation by recording arrival, waiting and services times on adapted patient time sheet within ten OPD service stations at Gahini hospital. The investigator entered collected data in adapted time study to compute the overall average waiting time at the OPD and he compared attained results to other similar studies to confirm whether the problem was long or short waiting time. The present study considered 400minutes at OPD of Gahini hospital considered to be long

waiting time since findings obtained at OPD of Jimma hospital in Ethiopia was 205minutes reported as long waiting time[23].

Again confirmed by results of another study conducted in Ethiopia, discovered that long patient waiting time has affected negatively health care systems for decades and decades where clients wait for primary healthcare services more than two hours[26]. That problem is commonly found in Africa and over the world countries like Kenya, Ethiopia, SA and Jamaica were cited among countries affected by delayed healthcare service delivery to their citizens[22]. In addition to that, the study reported average minimum time spent by patients at different service points include doctors' consultation was 48 min, registration 79.3 min, 43.2min at the laboratory and 36.2 min completed at the pharmacy. However, the average minimum process time used for registration was 5.1min, consultation took 8.5 min, and 162.7min seen in laboratory and for pharmacy was 3.2 minutes. According to set series of standards by the United Kingdom (UK) Government patient's Charter cites that around 30 min all healthcare service users must be consulted for their appointment time[4]. Patients waiting time is the crucial instrument for measuring patients satisfaction to quality of care as well as health institution's efficiency and effectiveness to deliver healthcare services [12]. The study conducted in South Western Ethiopia in an Out-patient Department (OPD) of Jimma hospital in the south western region indicated that, the average total waiting was equivalent of 4.5 hours and process time totaled to 4.64 hours separately[23].

3.3 Root causes analysis (RCA)

Related literatures consulted during the survey pinpointed that there a number of factors mentioned by healthcare providers and outpatients department service users as the most causative elements of long waiting time at outpatient departments [23,28]. Likewise, the staff at OPD of Gahini hospital interviewed listed the following seven potential root causes as the most likely leading reasons for patients' delay at outpatients' department of their health facility:

1. High workload/ shortage of staff
2. Flow problems
3. Queuing problems
4. Lack of efficiency
5. Logistical problems

6. Staff noncompliance with OPD schedule

7. Demotivated OPD staff

The summary of the above seven potential root causes were opinions enumerated by the staff through brainstorming as why there is long waiting time at OPD of Gahini hospital were labeled on the fish bone. Fish bone diagram serves to categorize and summarizes all possible root causes of the problem.

Figure 2: fishbone diagram
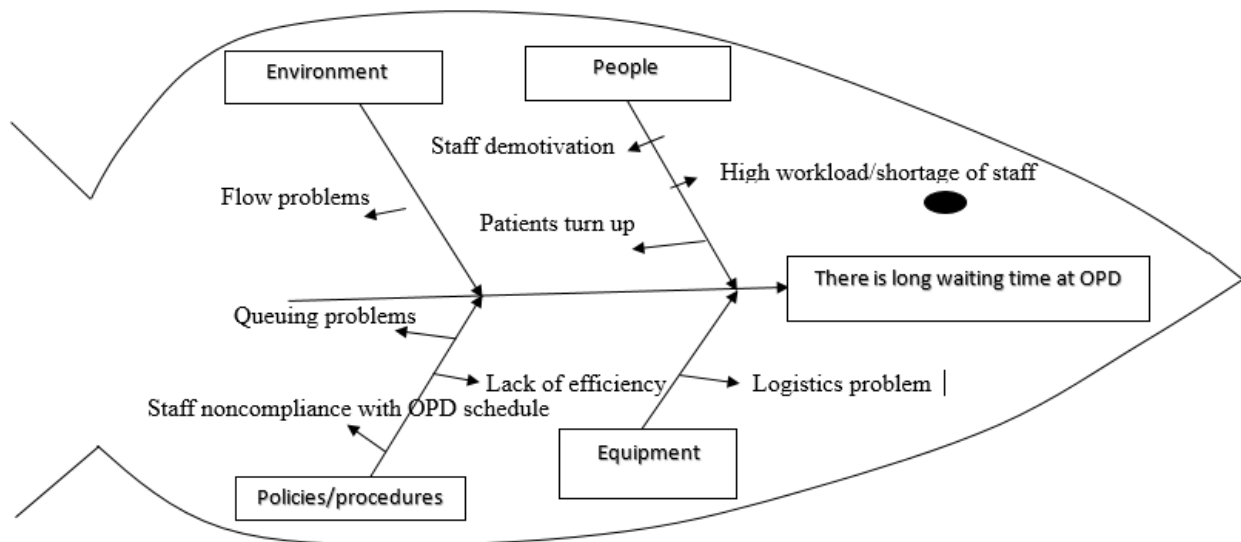
3.3.1 Verification of each root cause

The selected project team together with student carried out an investigation to verify the qualitative information for seven possible root causes suggested by interviewees in order to remain with the final root cause.

3.3.1.1 Shortage of staff

According to Meriam Mamabolo in South Africa by 2011, stated that healthcare providers and managers should use time management skills for caring of healthcare service users, irrespective of inadequate healthcare professionals[25]. We assessed if nurses and doctors at OPD are insufficient and overloaded, data provided by the office of human resource manager indicated

that two physicians and three nurses appointed on OPD daily duty roster. The results indicated that physician's ratio at the OPD of Gahini Hospital is one medical practitioner to 35 (1/35) service users whereas nurse's ratio is one nurse per twenty-three (1/23) patients. According to the study carried out by Charles R. GAFITA 2017 on consent form completion rate in surgical ward of Gahini hospital nurse ratio to patients was 1:9 while doctor ratio was 1:27[29]. Shortage of clinical staff especially physicians was listed as one of three major elements leading to long waiting time at outpatient departments of public hospitals in African countries [7,10]. The research carried out in South Africa cited that inadequate health practitioners compared to the heavy patients load demand in public hospitals yielded bad impression to the quality of health services deserved by service seekers in public healthcare settings [29]. According to the Ministry of Health and Word health organization, human resource patients recommended standards, the OPD staff experiences excessive much work in comparison with recommended international principles of clinical staff to patients' ratio [30].

The WHO target, for the physician patients' ratio is one physician to 1000 but this is contrary in less resourceful countries where doctor patient ratio is 1:25,000 among those African countries Ethiopia is inclusive[19]. Findings of a survey carried out by WHO about staffing need in Namibia revealed that due to the shortage of healthcare providers they worked under high pressure, for example 24 doctors were only available instead of 77 doctors and 602 nurses needed but 427 were only available[31]. Even though, the obtained results showed relatively high workload due to clinical staff insufficient, the Ministry of health recognizes that gap but emphases on good quality service delivery to all Rwandan citizens[28]. Basing on the study conducted by Husam Asfoor in 2014 cited that much time patients spend at the health facility is not a problem that is associated with the number of clients and the need on healthcare services[37]. Therefore, the project team rejected the shortage of staff / high workload to be the real root cause of long waiting time at the out patients department because it is not feasible details are in the table one below.

Table 1: Analysis of staff shortage

Possible root cause	Result	Decision	Comment
Staff shortage/high workload	Doctor patient ratio at OPD was 1:35 Standards in catchment area 1:1000 (WHO) 1:25,000(Sub-Saharan A countries) Nurse patient ratio at OPD was 1:23 Standards	Rejected	This problem is not feasible since staffing plan in public health facilities is under the control of Central level. Otherwise is a long-term intervention.

More still , the issue of shortage of staff/ high workload was identified among bottlenecks of OPD long waiting time but must be accepted if service seekers delay to receive healthcare service while healthcare service providers are too busy serving many patients[13]. On observation during the current study, this was contrary whereby patients were available at some OPD service points waiting the healthcare providers but no body to attend patients. We came to the conclusion that may be even if the number of OPD staff are increased to the needed number, clients would continue to wait longer due to lack of fulltime staff in some service points for instance around 7:00 am – 9:00 and lunch time we found nobody to attend patients in those OPD service points.

3.3.1.2 Patients flow problems

This was another potential root cause of long waiting time at outpatient's department mentioned by the project team through brainstorming. According to the study conducted at OPD of Mulago university teaching hospital in 2015,stated that patient flow problem is a cause of long waiting time when service providers are ready to serve patients who have reached at the health facility but those patients spend long time at the prior service point[21]. A study conducted in China at oncology clinic about outpatient's management reported that "patient flow is the most critical factor within the outpatient clinical settings" since it affects both clients' health and their level of satisfaction directly[29]. We did assessment for that root cause by using patient flow chart as a tool to verify at which OPD service point of Gahini hospital that blocks coherence sequence of quality service provision. The team rejected that judgment since around 8:00am, there were no overcrowded clients at service points prior to consultation and vital signs taking as reported that

it affects efficiency of timely service delivery at Gahini hospital. In addition to that, some service points that operated in parallel with those suggested that patients flow is an issue they did not report patient flow problem. For example, patients to NCDs consultation do first pass in other three OPD units, we identified consecutive in and out movements of patients with NCDs conditions whereas limited movements to the correspondent service units.

Still on that, eight out of eleven OPD service points equivalent of 73% are within one building excluding laboratory, medical imaging and dispensing pharmacy located in 200m, 100m and 40m respectively from the reception desk. In 2017, a survey carried out in Republic of China for reducing outpatients' waiting time in oncology clinic also confirmed that areas for diagnostic tests (x-ray, ultrasonic and blood tests), pharmacy, injection and transfusion were scattered not in the same building[29]. All the above provided tangible factors to verify the root cause, we decided not to consider the opinion of patient flow problems as the chief cause for patients delay at OPD.

Table 2: Analysis of patient flow problem

Possible root cause	Prior service points	Result	Tool	Decision
Patient flow problem	Photostat machine	At 7:24am many patients were sent to next section	flowchart and time study	Not considered
	CBHI	By 7:31am a big number of patients sent from CBHI to registration	flowchart and time study	
	Registration desk	Around 7:56am they had given patients to nurse vital signs section	flowchart and time study	

The table 2 indicates that patients do not wait long time as per service point sequence, thus the project team disapproved the forwarded suggestion not to be the real root cause of the problem as suggested by physicians and nurses through brainstorming.

3.3.1.3 Staff noncompliance with OPD schedule

M. Gondone and P. Zanwar 2012, they defined "staff scheduling" as the method whereby an organization creates to work timetables of its personnel to satisfy the demand for goods and services [37]. The same authors cited that staff scheduling is the most important technique applied in staff management.

Through discussions, the project team raised up a number of views to support their pinions as why staff noncompliance to OPD schedule is the real root cause of long waiting time, they said that some staff on the OPD schedule start work late and leave at any time even before serving all patients. Secondary some service points do not offer fulltime/ permanent services that is to say at lunchtime some service stations have to close doors and they break for an hour or more than one. Thirdly, some physicians would start OPD consultation services after inpatients ward round or physicians meeting but often they leave for home by 5:00pm. Scheduling of healthcare professionals is essential for instance patients need nursing care for fulltime in seven days out of seven days[36]. In a study conducted by Enabulele O et al by the 2018 in Nigeria, they recommended that to reduce long waiting time at OPDs physicians in consultation stations should comply "with their allotted slots and rounds should be taken prior or after the OPD hours" [9]. It seems staff noncompliance with OPD schedule is a common issue in health facilities, for instance Jing Sun et al 2017 identified that, "checking on attendance of on-duty doctors and giving financial penalties to late arrivals and early leaves" was among best strategies used to reduce waiting and raise outpatients satisfaction at the public tertiary hospital in Chine [35].

The project team collected the data to verify if really staff without adhering to the OPD schedule would be the real cause of patients' delay at the OPD of Gahini district hospital. We collected date by using time study to know average lateness of clinic staff to start the work at OPD. The survey revealed that average time for starting consultation services was around 10:00pm and closed by 5:30pm. The research calculated the service section provided fulltime healthcare services by using tally sheet, the results showed that in 11 service units only 4 (36%) provided fulltime services to patients whereas 7(64%) were closed during lunch hours with patients seated before their doors waiting to be attended. In addition to that, we found out at least one physician scheduled at OPD did ward round for inpatients in four days perhaps internally arranged. An article with title of "Doctor consultation schedule(OPD schedule)" stressed that doctor's timing

and availability are subject to change" [30]. A study conducted by Jerome Mpaata and Ajuna Albert on reduction of waiting time on new OPD patients at Kiswa health facility, the intervention selected to reduce waiting time was to make staff duty roster, thereby post intervention findings showed reduced waiting time from 120 minutes to 66minutes[31]. Staff noncompliance with schedule was due to staff inefficient in time management because ineffective time management result into service care providers inability to complete patients care activities designed by managers of the health organization[25].

Table 3: Staff noncompliance with OPD schedule or duty roster

Potential root cause	Service point	Result	Tool	Decision
Staff noncompliance with OPD schedule	Consultation services	Average starting time 10:00am	Time study	Accepted
		No fulltime services.	Tally sheet	
		In 4days out 5days, at least one doctor scheduled at OPD did inpatients ward rounds during OPD time	Observation and tally sheet	
	NCDs Reception, CBHI, Photostat, medical imaging	8am average starting time	Time study	Accepted
		No fulltime services.	Tally sheet	Accepted
	Pharmacy, cashier, nurse and Laboratory	8 am average starting time	Study time	Accepted
		Fulltime service (36%)	Tally sheet	Accepted

It was obvious that some staff at service sections start consultations late and leave before time; only 36% provide permanent services and some staff on OPD schedule attend to patients in wards during OPD time. The team came to the concuss that patients waited long time for diseases diagnosis; treatment and medical care management were due to staff noncompliance with OPD schedule. Therefore, the project team identified staff noncompliance with OPD schedule or duty roster as the real root cause of long waiting time at OPD of Gahini hospital. A

study conducted in Ethiopia to assess waiting and service time at public health and private facilities indicated that the major causes of long waiting time in public healthcare settings were "mismatch of patient arrival (arrived too early) and service commencement late, and staff inefficiencies in prioritizing attending to patients[26]".

3.3.1.4 Staff demotivation

Discontent of the staff would result from different reasons like insufficient incentives, poor health workforce management, and resistance to changes to mention but a few. For example, a study conducted at the OPD of Kiswa HCIII in Uganda by Naguru P and Drive H, staff suggested that lack of staff refreshments, unavailability of stress relievers or staff motivating strategies were among of determinants for patients long waiting time at OPD [31]. In the current study, some staff pointed out that low salary as per salary structure of district healthcare providers in comparison to those at the central health facilities resulted into staff demotivation among healthcare providers especially doctors who are on high demand. However, through brainstorming about causes of WT the issues of salary imbalance and removal of expatriate doctors on ordinary government budget acknowledged by some doctors.

To verify the reality of that opinion from the staff, we collected data from the offices of human resource and chief accountant to observe staff turnover and budget related to the staff incentives respectively. The data revealed that there was high staff turnover at Gahini district hospital mostly on the side of physicians since January to June 2019 out of eleven doctors 5(45%) doctors, 4(6%) nurses and 1(13%) laboratory technicians have left may be pursuing for best payment. Aging, records indicated that Gahini hospital has never secured total number of 16 doctors recommended by MoH and in five (45%) physicians who left only three (27%) replaced. Information obtained from chief accountants', we discovered that no incentives planned for OPD staff in the annual budget such incentives include staff trainings fees, refreshments to mention but a few. A study conducted in South Africa by the year of 2015 in public health facilities showed that dissatisfaction of healthcare providers due to their working conditions was significantly identified as the high percentage that influences quality of service delivery in those healthcare organizations[29]. Findings obtained by the project team indicted that there was salary inequity for doctors who unpaid on government ordinary budget. Although the project group

captured solid evidence regarding the above potential root cause of the problem, we dismissed the factor to be the final root cause of the problem that necessitating intervention for improving quality of service delivery at OPD because it is general condition to all district hospitals and not feasibly to solve within short period of time.

Table 4: Assessing staff demotivation

Root cause	Result	Tool	Decision	Comment
Demotivated OPD staff	45% doctor's left 27% only replaced Available doctors 63% 6% nurse and 13% Lab technician left were not replaced	Tally and observation	Rejected	A common issue in all departments
	About 100,000frw salary difference for Drs.	Observation	Rejected	General to all District hospitals
	a.550, 000×12 frw global budget for MTN airtime communication. b. 1,500.000frw in 2019 for end of the year staff ceremony. c. Zero frw OPD Refreshments and no specific trainings.	Observation		A common issue to the entire staff of health settings.

The strong reason forwarded by the group to reject the above suggested root cause in the table was that the issue is common to entire staff of the hospital and not specific to OPD. We also based on the unpublished data reported on the study carried out at Gahini hospital in March 2019 about staff satisfaction by quality improvement and accreditation team of the hospital. The results of that survey discovered that OPD staff scored highest poor satisfaction percentage (60%) in opportunities to learn more skills and general poor contentment score of all staff was 32.5%. More still, the report on staff at OPDs expressed highest poor points of 40% about their satisfaction on remuneration related to job experience, 29.1% was general poor satisfaction as the maximum followed by 26.5% as good whereas the least point obtained was 17.9% on excellent point ranking scale. In the same report, the staff from OPD wing did not express their

views about benefits they receive in relation to the staff from other health facilities, but the 43.6% was broad extreme satisfaction on average rank point and poor satisfaction of 21.4% was the second last to the excellent 11.1%.

3.3.1.5 Queuing discipline

In the current study, some of the team members said that some staff do not respect lines (queue) of patients by passing their relatives and friends to the respective OPD services they need. A study carried in Uganda by Musinguzi Conrad in 2013 cited that queue is an issue once healthcare services provided by staff are in inconsistent mode or service users not attended in accordance with the way they arrived at service unit[23]. This explains that clients who arrived first was the one served later, illogical queue (jump queue)[23]. In the current study, the researcher observed queue problem at doctor's consultation service practiced by some staff to their relatives deserve consultation services because of fearing long waiting time. According to the survey done on "reducing outpatients ' waiting time in oncology clinic" queuing discipline is one of factors for OPD long waiting time, with a regulation states that services are provided to the patients who are on line[23]. The similar author continued for explaining first-come-first-served (FCFS) and last-come-first- served (LCFS) as two orders of queuing systems used to attend to service seekers by service providers but the most common system used is FCFS in absence of a priority[23].

The research group collected the facts to ratify illogic queue stated by the project team during identification of potential root causes of long waiting time. Flow chart and tally sheet were tools used for collecting info at each service points mentioned in brainstorming. Results indicated that few patients at different service units received healthcare service without respecting numbers given at the reception regarding to FCFS used queuing system. Such service units and number of patients jumped the queue with favor of the staff from another service section of the health facility. We counted five patients at the CBHI unit, eight at reception desk, twelve at consultation services and ten at cashier counter and six patients at nurses for taking vital signs, other service points attended to all patients without facilitation to receive service. Based on how a number of patients who dodged the queue line is small in the study, this motived the project team to reject as final root cause of patient delay at OPD service unit.

Table 5: Verification of queuing discipline

Root cause	Result/service unit	Tool	Conclusion
Queuing discipline	Only 5 patients facilitated for checking eligibility of CBHI	Flowchart and tally sheet	Rejected
	Only 8 patients jumped queue line to be registered	Tally sheet	Excluded
	12 clients dodged line and served by the physicians.	Tally sheet	Not considered
	Only Ten patients at cashier counter skipped order to pay for provided services	Tally sheet	Rejected

3.3.1.6 Extra work leads to lack of efficiency

This factor describes that, Patients receive inappropriate service since available healthcare providers in that very service point are doing other tasks of the hospital instead of attending to patients[24]. Such activities include administrative work, staff meetings, billing patients, doing reports, preparation or teaching students[24]. Research conducted at two hospitals in North, West, Ethiopia by Melesse Belayneh et al in 2017 said that in addition to the insufficient healthcare workforces and work process, time completed in registering patients , taking vital signs and billing or process to pay treatment fees are the causes of patients waiting time at OPD[16]. A similar study on patients waiting time in Uganda at Kiswa HCIII reported lack of efficiency in the health settings is among potential root causes of service users long waiting time at OPD service units[31]. We used time study to prove if billing of patients, completing patients' administrative papers and reports they increase service process time. The results indicated that average process time for physician consultation services was 10 minutes, 3 minutes cashier counter, 7 minutes for taking vital signs and 13 minutes used in process time at registration desk. The obtained results are simplified and presented in the table six below.

Table 6: verifying lack of efficiency.

Root cause	Results /service point	Tool	Conclusion	Comment
Lack of efficiency	An average of 10 minutes for service time in consultation	Time study	Rejected	Less than 10 minutes would be screening but not consultation
	13 minutes service time for registration	Time study	Rejected	HoD awarded as the best staff and service of the year
	3 minutes taken for billing or paying cash	Time study	Rejected	This is reasonable average process time
	An average of 7 minutes spent for taking vital signs.	Time study	Rejected	Enough time since they record patients electronically and taking vital signs manually.

Genuinely, findings indicated that the work done in all service units related to patients care but not extra work for example electronic patients billing is necessary and medical reports are among of services needed by outpatients, thus the team rejected the pinion as real root cause of the problem. Again, the research team dismissed above root cause in the table since doctors were much complaining of inefficiency, but the results showed that process time at registration desk is far higher than that at doctors' consultation service station; hence, the team rejected less valued complaint.

3.3.1.7 Logistical problems

This is one of bottlenecks of OPD patients long waiting time, however, it would be the cause if the staff to provide services to the patients are ready but obstructed by absence or deficiency of major equipment like computers, chairs, rooms and more other required supplies[23]. In this

case, perhaps healthcare service seekers will wait long time for procurement processes of requests or   suppliers to supply the hospital or technicians to repair broken equipment [37]. Rebecca Bisanju Wafula in her research of 2016 at Kinyatta hospital mentioned that broken computers at the registration desk affect effectiveness of quality service delivery at OPD services unit[7]. Small equipment like weighing scale, thermometers , height scales, pens and books would cause patients to spend a lot of time at OPD of the health facility[35]. We carried out the study at OPD to observe missing equipment reported by the staff to be the hindrance of rapid service provision at OPD. The team used tally sheet and observation for calculating operating equipment, broken items and total items needed by service unit. The results showed that 94 % of items in all OPD service units were properly functioning, 4.2% items damaged and 2.8% was the pending requisition. Laboratory service unit had 5.3% of important damaged equipment including hematology and chemistry analyzers one per each type of analyzers.

However, during presentation of the project in the general staff morning meeting, the researcher highlighted the problem of having one cashier room in the entire hospital. This was a big issue especially for inpatients to get drugs at the right time. Unpaid medical supplies rarely dispensed to inpatients except for emergency cases and indigent patients. In addition, one cashier counter would block discharged patients and they sleep in the hospital for unintended nights because of long queue at one cashier's desk.   The second cashier's desk for inpatients and in case outpatients overcrowded in front of OPD cashier desk was put-up. Inpatients are no longer experiencing delays to receive medical supplies due to lack of where to pay before dispensed. The detailed information about verifying the issue of logistical problem at the service points entailed in the table on the next page.

Table 7: logistical problems for OPD equipment

Root cause	Result per service	Tool	Decision
Logistical problems	At reception 12/14, (86%) items present and 2 items damaged (14%)	Tally sheet	Rejected
	At nurses 36/36 (100%) available	Tally sheet	
	In consultation 17/17(100%) items present.	Tally sheet	Rejected
	At NCDs 17/20 (85%) items available, 15% requested	Tally sheet	
	Laboratory 35/38(92%) operating, 2(5.3%) damaged and 1(2.6%) needed.	Tally sheet	Rejected
	Cashier counter had 14/15(93%) of needed items	Tally sheet	Rejected
	Med imaging 15/17 available	Tally sheet	Rejected

According to the existing findings, we got as presented in the above table, the team rejected the potential root cause of logistical problems to be real reason why patients take long waiting time at OPD of Gahini district hospital because 94 % of equipment needed at OPD were available.

3.3.2 Final root cause analysis

After the analysis of each potential root cause of the problem, the project team identified staff noncompliance with OPD schedule to be real root cause of patients' long waiting time at OPD of Gahini district hospital.

3.4 Study population

The study population used in the current study was all service users who attended OPD service points at Gahini district hospital during working-hours for a period of 8 days in pre-post

intervention studies, and each phase took four days consecutively. The researcher selected different categories of personnel who works at OPD service units. The selected project team interviewed for gathering of possible root causes and implementation of strategies for improving an issue of long waiting at the OPD service points. Other researchers on waiting time used the same study population but with different data collection method to obtain outpatients waiting time like[10,18].

3.5 The sample size

The participants to the study were 70 carefully chosen healthcare service consumers at OPD service stations. Likewise, seven doctors, five nurses, three laboratory technicians, three staff at pharmacy, two from medical imaging, six support staff and administrators used for root causes analysis and project implementation. The student used a sample of 140 patients in pre-post intervention to obtain overall waiting time, waiting time and process time, through an active observation study by the student and research assistants to record time at every service point of OPD on 8th-11th January and 23rd-26th July 2019 respectively. During the study period, there was no any similar studies related to the patients waiting time that had earlier conducted in that health facility. The proportion of service seekers waited longer than recommended waiting time to get healthcare services was unknown, therefore, the researcher used Yamane's formula to determine the sample size [34]. The sample size was 70 enrolled participants within four days of the study period in pre-intervention phase. Below the formula used to calculate the sample size of the current study project.

$$n = \frac{N}{1 + N\,(e)\,2}$$

Where n = sample size desired.

  N = population size.

 e^2 = desired margin of error which was **0.01**

$$n = \frac{70}{1 + 70\,(0.01 * 0.01)} = 69.5134 = 70$$

The student also applied the above formula for calculating sample size used in the post project implementation

$$n = \frac{N}{1 + N(e)\,2}$$

Where n = sample size desired.

  N = population size.

  e^2 = desired margin of error which was **0.01**

$$n = \frac{70}{1 + 70\,(0.01 * 0.01)} = 69.5134 = 70$$

The study participants recruited the post intervention phase were 70 out patients, thus both phases of data collection enrolled 140 outpatients.

3.6 Sampling technique

The student used convenience sampling technique or quota sampling technique whereby the researcher chooses in advance on certain key characteristics of the sample, the participants in the research may be chosen just since they are accessible to the investigator [35]. The researcher selected eligible participants from all patients who visited OPD; data was collected through direct observation, and recording of arrival time at OPD, in and out time of service points. Trained research assistants, staff and researcher would record time on adapted patient's time sheet and collected at the last service point. Then at the end of day, all gathered timesheets handled to researcher for computing data into time study format. The study population was composed of all clients looking for outpatients' care service at Gahini district hospital in a duration of eight days of the study period that is to say four days in January and other four days in July 2019 stipulated in sample size.

3.6.1 Inclusion Criteria

Female/Male patients who were above 15 years old arrived at OPD service points of Gahini district hospital with willingness to participate in the study and who arrived at OPD in the presence of data collectors from 7:00am to 11:00am were included in the research.

3.5.2 Exclusion criteria

This criterion considered all outpatients presented severe impairments without consent of the caregiver, clients who were seeking services in departments of ophthalmology, stomatology, physiotherapy, ARV and mental health. Customers who already participated in any previous days, any patient arrived earlier than the research assistants did and for those ones arrived after 11:00am and onwards captured by exclusion criteria.

3.5.3 Variables of the study

The current study was composed of two variables, one was dependent variable consists of the global average waiting time of all service points, average waiting time and process time at each service point. The average waiting times are continuous variables that calculated from summing up waiting and process times of all OPD service units. However, average waiting and service times for service station obtained after computing average waiting or process times at a particular OPD service section. Whereas the independent variable was patients' arrival time at OPD service points but the aim of the study was not interested in independent variables. The variables attained from two different samples one was for baseline and the second sample was for evaluating the intervention of the project implementation.

3.7 Data collection

According to the daily OPD's statistics, the department usually receives an average of 70 clients per day. We collected data at OPD in two segments the first segment was for obtaining baseline data and the second phase was for evaluating the implementation of intervention strategies. In each phase of project implementation, we collected data in repeated four clinical days in working hours and daily-required sample size was 18 participants. The research assistants under the supervision of the researcher during the period of gathering information would record waiting and process times on timesheet paper presented by the participant at respective service points. The enrolled patients in the study approached with respect by research assistants and requested freely to participate in the study.

Immediately someone who has accepted to join the survey provided a time sheet study paper with recorded arrival time and patient's number. Every research assistant was bearing a well-adapted functioning watch or mobile phone; s/he would record arrival time at the services unit

and end of service delivery at that particular unit. Hence, the same procedure could continue to next service point up to last service or patients' departure. All eligible and willing participants who arrived in the presence of data collectors from 7:00am to 11:00am employed in the study, and would be followed-up until around 6:00pm or when s/he ended needed service. During the study period, we considered outpatients to be overnight patients when an OPD service section stopped to attend to the participants due to closure of day healthcare services.

3.7.1 Data collection method

Generally, there were two categories of participants in the study; the first category was patients who were looking for healthcare services at OPD and second category was healthcare providers serve OPD service points. For the category one we obtained data by measuring the length of time completed by service users before receiving healthcare services and the time spent by healthcare providers while attending the patients. The secondary category included different levels of health worker forces who attend to patients at all sections of OPD. The researcher interviewed the staff to get key information, which could help in smooth running of project implementation.

3.7.2 Data collection tools

The study used two data collection tools; the main tool was adapted timesheet for measuring pre-post intervention overall average waiting time, total average waiting and total average process times at every OPD service point. The timesheet tool would detect patients' flow pathways with effect of the time a patient reached at OPD and their movement through related service units up to the last time of service delivery or patients exit to the health facility. The researcher also used group and individual brainstorming method with the staff to capture their opinions about the potential root causes of long waiting time, root causes analysis, interventions and strategies lied down for project implementation in order to overcome the issue of patients' delay to receive healthcare services at Gahini district hospital.

3.8 How the problem was discovered or identified

The researcher discussed with healthcare workforces in different departments of the hospital such as in store-pharmacy, surgical ward, internal medicine, emergency, OPD service points and medical record unit. They mentioned potential problems in their departments that result into poor

quality of service delivery. Among the raised amount of problems, the researcher considered only three problems to be the utmost alarming matters to tackle for improving quality of healthcare service provision at Gahini district hospital.

3.8.1 Selection of the problem and participants

The researcher presented the identified problems to the hospital Director General and Director of Administration and Finance; there were three major identified problems among others the first one was patients' long waiting time at OPD, the second one was poor medical record management and unstandardized patients triage at emergency was the third identified problem. The leaders did not consider too much on third problem others scored the same percentage, that is to say one would prefer firstly to work out of medical record management and another about patients long waiting time respectively. The best conclusion chosen was to present the problems in the hospital's management committee meeting to select one problem out of three identified potential problems. The management committee selected patients long waiting time at OPD of the hospital as the suitable study project to implement for improving quality of care to the clients who seek for healthcare services at Gahini district hospital. Again, in that management committee the researcher got an opportunity and given go ahead to do power point presentation in the morning general staff meeting for project awareness and support. The presentation just was bout definition of key words in the project, study population, negative effects of the problem and significance of the project implementation to the hospital, patients and healthcare providers jointly. In the morning staff meeting, related healthcare workforce agreed to participate and provide required data for facilitating the project implementation.

3.8.2 Prioritizing the problem

The student presented all three problems to the management committee, which prioritized them depending on how the problem is frequent, critical and common in the setting. With that regard, patients' long waiting time at outpatient department scored highest points than poor medical record management and non-standardized patients triage in emergency unit of the hospital. The hospital director stated that we would like to have more quality improvement projects for improving quality of healthcare service delivery at Gahini hospital. He said that such research

projects would help the hospital for seeking funds from donors to solve some of the hospital's potential problems, which affects patients' accessibility to quality healthcare services.

3.8.3 Collection of baseline and evaluation data

The researcher used adapted patients' timesheet to collect information/data whether the problem of patients' delays at OPD is really a problem, by collecting baseline data we obtained pre intervention results used to set the objective of the study. The investigator carried out an individual and group brainstorming method with staff for finding potential root causes, real root cause, list of interventions and final intervention to reduce patients long waiting time. After attaining baseline, we formed the project team purposely for assisting the researcher in project implementation. In middle of July 2019, we collected data to evaluate the progress of project execution findings indicated significance change with good achievement in overall average waiting time.

The successfulness of the project implementation in both phases was through due to full support from the hospital managers, all concerned staff and research assistants each and everybody played an important role, still we need some of them for the sustainability of the project. The list below shows the hospital team participated actively in pre-post project implementation either in data collection or in intervention strategies:

-Hospital leaders**,** Clinical director, Doctors, director of Nurses, NCDs clinician, Pharmacy team (store and dispense)**,** Diagnostic tests departments, Receptionist, Public relations officer/customer care, Quality Improvement/Accreditation officer**,** OPD nurses, The hospital planner**,** Former MHA student, HR manager and CBHI agent.

3.9 Intervention

According to the above-identified root cause, the project team suggested various alternative solutions to eliminate the problem of staff noncomplying with OPD schedule. The team assessed alternative solutions in a comparative analysis based on impact, cost, time and feasibility of each intervention to implement staff compliance to the OPD schedule. Here below is the list of alternative interventions recommended by the project team that would be effective to diminish lengthy of time spent by patients at OPD of Gahini district hospital:

-Training of OPD staff on time management

-Improving accountability mechanisms to the personnel who do not respect to the OPD schedule.

-Reminding staff who are on schedule in advance about punctuality, fulltime service delivery and patients' care through SMS to their mobile phones.

- Proclaim names of good and bad performing staff at every Thursday in OPD staff meetings.

Jing Sun et al 2017 applied the following three interventions for reducing waiting time for consultation service point and increasing outpatients' satisfaction at the public general tertiary hospital in China:

a) Financials punishments to the doctors on schedule who come late and leave before time. b) Informing doctors on duty roster in advance at least a day before via text SMS to the mobile phone about number of patients and timekeeping, c) identifying and embarrassing on-duty doctors who were not punctual for more than 10 minutes in bad performances at weekly regular meetings[35].

3.9.1Comparative analysis

The project team went ahead to construct a thorough comparative analysis as observed in the decision matrix below.

Table 8: Decision matrix

		Evaluation criteria (1-5) (5= good, 1= bad)				
No	Criteria	Impact	Feasibility	Cost	Time	Total
1	Training of OPD staff on time management	5	4	4	5	18
2	Improving accountability mechanisms to the staff who do not respect to the schedule.	5	1	5	3	14
3	Reminding staff who are on schedule in advance about punctuality, fulltime service delivery and patients' care through SMS to their mobile phone.	4	4	4	3	15

4	Proclaim names of good and bad performing staff at every Thursday in OPD staff meetings.	5	1	3	3	12

Depending on the comparative analysis, the project team agreed to carry out training to the concerned health workforces on time management. The training was aiming to clarify and explain the importance of effective time management in healthcare facilities, availing OPD schedule on time and other issues related to improve poor quality of service delivery caused by long waiting time. The project team also suggested that in addition to the training, hospital managers should carry out regular supervision to guarantee that concerned personnel must comply with lied out strategies. The list below entails a variety of tasks selected by the team for eliminating the identified real root cause of prolonged patients waiting time at OPD of Gahini hospital:

-Training of concerned personnel about time management: After developing terms of reference and training manual, the clinical director and researcher conducted a three-hour training session to doctors and other OPD staff about the importance of time management in healthcare facilities.

-Reinforcement of staff awareness on time management: After training the staff, clinical director, director of nursing and the researcher posted leaflets and announcements at all OPD service stations for strengthening received knowledge in training. We conducted short meetings for reminding trainees about learned techniques of time management and giving opportunities trainees to report for inhibitors of strategies implementation.

-Availability of OPD schedules on time: The project team agreed that clinical director and director of nursing must print and post schedule at all OPD service stations before the end of the current month and ensure that all concerned personnel are aware of new schedule via text SMS, WhatsApp to their mobile telephones.

-Monitoring and evaluation: Clinical director, director of nursing and the administrators were supportive in implementation of planned strategies since senior cadres deserve special monitoring and evaluation. Monitoring for time management in healthcare professionals is very crucial aspect in healthcare organizations as it increases of quality service delivery specifically at OPD on reducing patients waiting time.

The best intervention selected to reduce patients long waiting time at OPD of Gahini district hospital was training OPD healthcare professionals on time management.

3.10 Measurement of indicators

The researcher measured the effectiveness of the intervention to evaluate decreased overall average waiting time, reduced average waiting and process times at each OPD service point. Again, we assessed the number of staff trained, number of trainings conducted and availability of posted leaflets or reminders on time management at OPD to evaluate the effect of intervention. Reduced overall average waiting time, decreased average waiting and process times at each service point were outcome indicators whereas number of staff participated in training, trainings conducted and availability of OPD leaflets or reminders were process indicators of the intervention.

3.11 Data analysis

The study used Paired t tests for comparing pre-post intervention data of decreased overall average patients waiting time, reduced average waiting and process times at each OPD service point. Descriptive statistics mean waiting calculated by using adapted excel sheet time study. SPSS version 21 and Microsoft excel with P-value set at 0.05 used to analyze all statistical tests for the significance of pre- post intervention data. Tables, figures (fishbone and patient flow chart) used for data presentations.

3.12 Ethical consideration

UR College of Medicine and Health Sciences Institutional Review Board provided ethical clearance and Director of Gahini district hospital gave a permission to the investigator to conduct the study in the setting. All recruited participants in the survey had verbally consented before joining the research; we respected participants' confidentiality and privacy by using numbers to substitute their names, anonymous data and voluntary participation (appendix vi).

CHAPTER FOUR: RESULTS

4.1 Introduction

This chapter entails pre-post intervention findings obtained during the current study on overall average waiting time that is to say total average waiting and total process times, average waiting and process time per service station. Likewise, the research would state some qualitative information recorded on data collection tool including number of outpatients who took overnights due to delayed services, admitted and referred outpatients to other health facilities.

4.2 Overall patients waiting time

Overall average waiting time referred to the summation of both average service and average waiting times for all service stations[24]. The current study assessed patients waiting time at OPD of Gahini district hospital, 140 outpatients recruited in the study whereby 70 outpatients used for obtaining magnitude of the problem in pre intervention phase and 70 employed in post intervention to evaluate the progress of the project implementation. The global average before intervention patients waiting time at outpatients' department of Gahini health facility totaled to 400 minutes of which 338 minutes (85%) was the average waiting time and 62 minutes (15%) was process time at all OPD service points. According to the comments written by research assistants on the data collection timesheet, we found that out of 140 total patients participated in the study, ten patients admitted in different departments, six transferred to the referral hospitals, six given appointments, seven pregnant mothers sent to see gynecologist and three of them took overnight while untreated before intervention phase.

The findings after intervention indicated that global average waiting time was significantly reduced from 400 minutes to 193 minutes (52%) with P<0.001. The results in the table nine below showed that the global average waiting time significantly changed in six service units out of total ten service points. This implies that six service stations out of ten indicated good significant change with p<0.001. Non-significant changes found at NCDs, laboratory, medical imaging and dispensing pharmacy service stations with p=0.576, p=0.673, p= 0.394 and p=0.292 respectively. Pre-intervention data discovered longest overall average waiting time at doctors' consultation 146 minutes, followed by cashiers' counter 47minutes, third was 40min at

registration desk, 36min at laboratory and 35min observed at nurse triage station. Pre-intervention results revealed that minimum overall average waiting time obtained at Photostat machine, medical imaging and distributing pharmacy counted 12min, 13min and 16min respectively. After intervention, results of overall average waiting time indicated that patients had the smallest waiting at Photostat machine 4min and dispensing pharmacy 6min. However, after intervention phase we found the maximum global average waiting time at doctors' consultation equal to 54min, followed by laboratory 32 min, NCDs 25min and cashier counter scored 22 minutes as information detailed in the table 9 below.

Table 9: Pre-post overall average waiting time

No	OPD Service point	Pre-Intervention (min)	Post Intervention (min)	Change (min)	P-value
1	Photostat Machine	12.33	4.212	8.1212	0.004
2	CBHI	24.030	9.076	14.9545	<0.001
3	Reception	40.606	18.561	22.0455	<0.001
4	Nurse triage	35.445	13.288	22.1667	<0.001
5	Dr. Consultation	146.409	54.394	92.0152	<0.001
6	NCDs Consultation	31.470	25.152	6.3182	0.576
7	Med imaging	13.515	10.258	3.2576	0.394
8	Laboratory	36.152	32.045	4.1061	0.673
9	Cashier counter	47.258	22.197	25.0606	0.018
10	Pharmacy	16.182	6.045	10.1364	0.292
	Overall average waiting time	400.273	193.106	207.1667	<0.001

4.3 Average waiting time at service stations

Waiting is defined as the amount of time consumed by service seekers while waiting healthcare professionals to provide needed service[4].

The pre-intervention findings of the study revealed that average time patients waited to get services was 338 minutes corresponding to 85% of the overall average waiting time. Patients completed excessive average waiting time at doctors' consultation section with 138 minutes while the least average time patients delayed at medical imaging and Photostat machine were 10 minutes.

The average patients waiting time in the post intervention reduced significantly from 338 minutes to 147 minutes statistically with $p<0.001$. Results in after intervention phase revealed that patients delayed less at dispensing pharmacy and Photostat machine with equivalent of 4 minutes per service station. Even, after intervention doctors' consultation scored the longest average waiting time of 45 minutes dropped from 138min and followed by cashier counter with 20minutes reduced from 44min in post. Baseline findings showed that the longest waiting time was 138 minutes, the mode waiting time was 29 minutes and the minimum time was 10min observed at medical imaging and Photostat. After intervention, the maximum waiting time was 45 minutes, 4minutes was the mode waiting time and the minimum waiting time found at Photostat and dispensing pharmacy units. The above information for average waiting time simplified in table 10 below.

Table 10: Average waiting time before and after intervention

No	OPD Service point	Pre-Intervention(min)	Post Intervention(min)	Change	P-value
1	Photostat Machine	10.788	4.015	6.7730	0.010
2	CBHI	21.455	8.091	13.3636	<0.001
3	Reception	27.785	15.323	12.4615	0.003
4	Nurse triage	29.197	9.121	20.0758	<0.001
5	Dr. Consultation	138.288	45.152	93.1364	<0.001
6	NCDs Consultation	29.561	22.197	7.3636	0.424
7	Med imaging	10.303	7.152	3.1515	0.355
8	Laboratory	16.045	13.030	3.0152	0.486
9	Cashier counter	44.970	20.803	24.1667	0.049
10	Pharmacy	13.197	4.000	9.1970	0.186

Average waiting time	338.594	147.439	191.4545	<0.001

4.4 Average service/process time at OPD service sections.

Process time referred to as the quantity of time a service user complete in physical contact with healthcare service providers at a service point[24]. According to the results obtained before and after intervention, the total average process time a patient completed with healthcare providers at all service point of OPD in Gahini district hospital was statistically significant with p =0.005. The findings concluded that averagely patients were in contact with healthcare worker force at the entire OPD for 62minutes. Laboratory service unit took the lead in average process time the second was reception desk followed by doctors' consultation that is to say 20 minutes, 13minutes and 9minutes respectively. Nevertheless, patients had few minutes with healthcare providers at Photostat machine with an average of 1minute, 2 minutes were also less process time observed at CBHI and dispensing pharmacy two service stations. Results for after intervention discovered highest average process of patient in contact with service providers was at laboratory for 20minutes and doctors' consultation10minutes. However, professionals in four service units had the minimum average service time of about 1min in contact with service seekers. After intervention finding indicated that average process time dropped from 62minutes to 46 minutes with significant change of p=0.005. We observed constant average process time at laboratory service in before and after intervention phases, which was equivalent of 20minutes. Observe details about the results of average process time in the next table 11.

Table 11: Average process time before and after intervention

No	OPD Service point	Pre-Intervention (Min)	Post Intervention (Min)	Change	P value
1	Photostat Machine	1.833	1.030	8030	<0.001
2	CBHI	2.333	1.303	1.0303	0.008
3	Reception	13.470	3.470	10.000	<0.001
4	Nurse triage	6.545	4.333	2 .2121	0. 027
5	Dr. Consultation	9.167	10.212	-1.0455	0.560
6	NCDs Consultation	3.470	2.015	1.4545	0.128
7	Med imaging	3.955	3.030	9242	0.495
8	Laboratory	20.788	20.121	0.667	0.927
9	Cashier counter	3.742	1.348	2.3939	0.001
10	Pharmacy	2.864	1.121	1.7424	0.001
Average process time		**62.742**	**46.030**	**16.7121**	**0.005**

CHAPTER FIVE: DISCUSSION OF RESULTS

5.1 Introduction

This chapter serves to clarify the after-intervention achievements, failures, what needed to improve, challenges and way forward to address encountered challenges during project implementation based on obtained findings. The present study carried out at OPD of Gahini DH with the aim of producing evidence-based information that would help to reduce patients long waiting time at OPD for improving the hospital's effectiveness and patients' quality of care.

Generally, conducted regular discussions with related OPD staff and senior management team significantly improved the problem of long waiting time for service delivery at OPD of Gahini hospital. Before intervention, overall average waiting time dropped from 400minutes to 193minutes. Through brainstorming, we discovered that staff noncompliance with their respective OPD duty schedule was the chief cause of much patients' delay at OPD service stations. Therefore, project team decided to carry out regular discussion meetings with OPD staff and senior management committee as the best intervention for reducing patients long waiting time at OPD of Gahini DH. Findings at some service stations did not indicate significant changes with the intervention. For example, patient in contact with doctor before intervention was 9minutes and after intervention increased to 10minutes because of new open electronic system doubled service time.

5.2 Overall average patients waiting time

Results for before intervention of the present study indicated that global average waiting time was 400 minutes corresponding to an average of 6:40 hours. Long waiting time is rampant in Africa, for instance a study conducted in Uganda had overall waiting time was 346 minutes for a patient to be seen by any healthcare provider but measured in median with sample size of 401 patients [23]. Results for pre-intervention of the current study were higher than results indicated by Khani R Al in 2015, at LV Prasad Eye Institute (LVPEI) overall waiting time was from 45 minutes to 6 hours (360 minutes) but at Retina Medical clinic was fluctuating between above 180 min to 60 min and 30 min[40]. After intervention, overall average waiting time decreased significantly to 193 minutes with p< 0.001. However, slightly higher than findings in three

hospitals; one was in Nigeria mean waiting time was 85 minutes, 149min at Felege hiwot and 94 min at Debre markos hospitals in Ethiopia [19].

Nigeria and Ethiopia conducted various studies on long waiting time than Rwanda it could be the cause of good improvement on waiting time. In addition to that, doctor to patient ratio at Nigerian hospital was 1doctor to 16 patients compared to Gahini hospital it was 1doctor to 35 patients. Enabulele O et al 2018[12], foud that overall waiting time to see physician was about 120 -240 minutes similar to the results of the present study where doctor attended to the patients in 146 minutes. OPDs of Gahini hospital and Benin teaching hospital among causes of long waiting time identified were scheduling problems. Unfortunately, different literatures consulted by the researcher indicated long overall waiting as the major cause of patients' dissatisfaction but few of them intervened in reducing long waiting time at OPD. Asfoor H in 2014[32], by using queue splitting queues as the best intervention was able to improve waiting time at the registration and taking vital signs. Contrary, we got significant changes after the intervention registration had 40min dropped to 18 min(P=0.001) and nurse taking vital signs reduced from 35 min to 13min(P=0.001) by using discussion meetings with hospital staff as the best intervention. Thus, this implies that we can use different interventions to reduce overall patients waiting time as longer as were selected by the project implantation team.

5.3 Waiting time at all service points

The baseline findings of the current study discovered that waiting time at 10 service stations of OPD was 338 minutes counting to 85% of the overall average waiting time. The results indicate that outpatients delayed too much to receive services in comparison with those under a survey done in Iran by Mohebbifar R et al 2013 from which average waiting time was 245 minutes in a sample size of 160 participants[10]. Probably the average waiting time at the above hospital in Iran was less because it was a single OPD service section whereas obtained average waiting time at Gahini hospital measured in ten OPD service sections.

At teaching hospital in Iran, used appointment system to reduce waiting time by 28.9% and considered as an effective solution in the project implementation[10] . However, the current study used staff training on time management and was able to reduce waiting time by 57%

without increasing doctors' overnight work as reported in the above study. After intervention, average waiting time of the present study was 147 minutes is much more to the findings obtained at Benin teaching hospital that was 120 minutes[12]. Post intervention strategies reduced waiting time by 50% (from92 $\pm$ 10 min to 42 $\pm$ 5) and considered as great achievement in patients' satisfaction to service delivery[36]. Before intervention, findings (92 min) of the above study were less than before intervention findings (338 min) of the current study; therefore, staff training on time management was an effective intervention for reducing waiting time. Thus, the present study has still long way to go for improving waiting time since some studies discovered that patients were dissatisfied if waiting time exceeds 120 minutes such studies include those carried out by Tana VV 2013 and Pandit A 2018 [12,14] among others. Studies conducted by Pandit BAP and Tanima 2018, Sun J et al 2017, BaA et al 2017,Johann Daniels 2015 and Wenxi Yu et al 2017[2,5,6,36,41], found out longest waiting time was before doctors' consultation station than other service stations without similar causes. Likewise, at the OPD of Gahini hospital we observed staff noncompliance to the OPD schedule as the unique real cause of longest waiting time at the doctors' consultation service points compared to the above five cited studies. This was true since after training staff on time management strategies was remarkable improvement for staff compliance with their schedule and no more outpatients took overnight without management like before intervention.

By Egbujie BA et al in 2018, post intervention results point out that waiting time at chronic NCD and HCT services, increased from 132min to 191min[42]. Results indicated negative changes and extremely excessive delay when compared to the findings of the present investigation at NCDs service station dropped from 29min to 22min. Negative changes might result from not selecting the best solution, resistance to changes, and poor implementation plan among others. Singh et al 2013 publicized the standard waiting time for some OPD services at district hospitals. For example gathering OPD tickets 1min, laboratory investigations 10min and two to three min for dispensing drugs at pharmacy[18] . Comparably after intervention findings at Gahini district hospital, patients spent more three minutes at laboratory and one minute at the dispensing pharmacy than at university teaching hospital in India. But results at pharmacy was 123 minutes and 32minutes at the university teaching hospital in Uganda, this suggests that waiting time defer from service to another service within the same health facility or from hospitals in the same country even from one country to another country[23].

5.4 Service time/process time

It's obvious that we have different healthcare professionals at the health facilities and the time they would spend in contact with service users in their respective service units is also not the same , therefore it was an ideal to measure average process time at every OPD service station [12]. The current study found out that the total average process time before intervention was 62min counting to 15% of the overall waiting time at the OPD of Gahini district hospital, whereas changed significantly to 46min (p=0.005) after staff training on time management. The time a patient spend in contact with a service provider would depend on type of service provided and the style a healthcare uses. For instance, doctors' consultation described to be faster/short if takes less than 6 minutes or slower/long when a doctor consults a client within 10+minutes[43]. According post intervention findings in the current study may be doctors did not use time effectively while processing services or interrupted by other obstacles.

Patel R and Patel HR 2017 findings' would be correlated with previous results that doctors consulted 56% of clients in less than 5min, 34% in 5-15min, 4% from 15-30 min and 6% exceeded 30min[1]. Whereas in the current study, did not present the process time in ranged contrary to the previous study and findings at doctors' consultation increased from 9minute to 10min after intervention due to the open electronic system introduced during project implementation. Patients had longest waiting time with laboratory technicians of 20 min before and after intervention at OPD of Gahini hospital. Constant process time at laboratory was associated with decreased number of laboratory technicians since there is one who left and not yet replaced. After intervention registration process time of the present study was 3min conquered exactly with results found at Saint Rita hospital in South Africa where in contact with receptionists was 3 minutes [41]. Even in developed countries patients spend long process time within registration service unit, for example in Republic of Chine registration is among the most service station delays patients to receive health services[4]. Some factors are determinants for lengthy of process time at the registration such factors include skills of healthcare professionals, number of patients, number of registration desks, and internet network system among others.

5.5 Factors associated with the project success

To begin with, a brief PowerPoint presentation done in the morning general staff meeting attracted the entire staff of the hospital they rendered support and smooth running of the project. Secondly, the hospital senior management team provided the support because waiting time was always among points on agenda in the meetings of management committee. Furthermore, the hospital was in the process of acquiring accreditation level one and the study would increase accreditation points since it intended for improving the quality of health service provision. Again, we know that patients long waiting time result into anxiety and frustrations for both healthcare workers and the patients, staff welcomed the project warmly because it was after reducing patients long waiting time at OPD units. Therefore, OPD staff appreciated for prioritization of their problem and involving them for seeking sustainable solutions to the problem. Still on that point, every Thursday there is departmental staff meetings, it was an opportunity for evaluating the progress, challenge and plan accordingly.

In addition to that, the project team selected clinical director as the taskforce focal person who played big role in regular meetings with doctors, OPD staff and is an active member in the hospital management committee. More importantly, guidance and support provided by supervisors for improving and shaping all steps from project proposal to the capstone. Gained knowledge and skills from MHA program such as leadership skills helped in different ways like dealing with individuals at any level (leadership styles), research literacy assisted in convincing staff audience, SPS lessons used in systematic project implementation to mention but a few. Furthermore, the research was a real practical study any change on the ground due to the intervention was obvious and forced many hospital workforces' engagement through implementation process including hospital leaders. The researcher used a well-trained team of students as research assistants in the processes of data collection with specific bags that enabled study participants to identify them easily from the hospital staff and other people. Again, timesheet data for collection had a unique label and was simple even for peasants to separate it from other hospital papers. Last but not the least the researcher and taskforce focal person would carry out regular monitoring and evaluation of project implementation, involving OPD staff to take decision and owning the study.

5.6 Challenges encountered and solutions

There are numerous challenges encountered in research projects some are under researchers' control and others are out of their control, below are the inconveniences in the current research and suggested solutions:

The major challenge was the resistance to change from routine work by some few staff for implementing the selected solution to reduce long queues at OPD service points especially in front of consultation rooms. It was contrary to what the staff research team had committed while selecting the best solution. Good collaboration of the student with hospital staff at all levels, committed clinical director, participation of accreditation team and willingness of the hospital managers to improve quality of service delivery helped to change the mindset of resisted staff. Training related OPD staff on time management including head of departments persuaded them and they developed spirit to change.

 Secondly, due to insufficient healthcare service professionals was difficult to avail required number of staff for providing timely and permanent services. Hence, after training the staff realized the benefit of OPD duty roster adherence they could improvise to ensure that there is at least one staff per service point for prompt and fulltime service provision. Still more some OPD service stations are scattered from OPD general building premises like diagnostic test services and pharmacy, thus needed many research assistants to follow study participants to record time at each service point. The researcher solved that issue by distributing trained and committed research assistants to all OPD service stations with inclusion criteria to record data on time sheet.

In addition to that, all healthcare providers at OPD were aware of what is taking place during data collection and some service points' staff pretended to change their routine timekeeping and working manner. The student overcame that by explaining to them that the project is aiming for quality improvement purposes not to punishing the staff. Furthermore, it was tiring to gather data from doctors due to their timekeeping the whole day at service points or work designation. This was possible because of good collaboration with them, with hospital director and clinical director it became possible, and to interview them in-group or individually. Still more, the researcher had planned to the collect data at least in consecutive two weeks but changed into four

days per intervention because of limited time for attending course work, serving patients and hospital attachment. We reduced that issue by choosing small sample size in a short period time, using trained students for data collection with an average of 17 respondents a day. Again, limited time forced the study to use one method for gathering information from staff by brainstorming; rather than other methods such as questionnaire completion to obtain data from the staff could take much time. The researcher faced a challenge of long delay to access standard tool for data collection at OPD services resulted into delaying in data collection but later downloaded and adapted to OPD service stations of Gahini district hospital (patient waiting time sheet). The excel timesheet for data entry was complicated to use it could interpret data in different way especially for measuring time and counting number of hours, even it considered zero as 12:00:00 am this would affect entire results on WT or PT. The student had to look for expertise in excel Microsoft to change the format cells.

During brainstorming in root cause analysis, the student observed culture of hiding information some staff feared to know them because of exposing hospital's inefficiency. Noted while we were collecting potential root causes and listing alternative solutions of the problem. The staff who participated were first assured that their suggestions are confidentially kept and their names must not appear anywhere in the research project. Last but not the least, the researcher found out that there were many studies conducted about patient waiting time but most of them are ordinary research-based than capstone-based design, which was had to get literature specifically related to intervention of the current study.

5.7 Needed to improve

To select other interventions such as training staff about constrain in staff scheduling, adapting OPD policy to the time management by adding in aspect of timekeeping regardless of that one stipulated in the OPD staffing plan risk area II. Lobbing for the hospital management team for introducing possible incentives that would facilitate the staff for providing permanent service delivery. Seeking ways of engaging in the hospital board of directors for strengthening sustainability of project implementation. Improving the measurers for the staff being accountable, it would be great ideal to promote accountability practice for those who are out of healthcare regulatory guidelines, for example financial penalties to mention but a few.

5.8 Achievements of the project

The project was able to reduce the overall average patients' waiting time at OPD from 6.40 hours to 3.13 hours (51%), which was good achievement in the after-intervention phase. The student was able to meet the project implementation plan. The hospital senior cadres' team and management committee were able to understand and rendered support in the whole course of the project execution. Therefore, the hospital leadership will continue to fulfil the long-term objectives of the project even if we were in the weaning phase of the project implementation. Generally, some healthcare workforces gained knowledge in the implementation of quality improvement projects; thereby using minimum resources to solve major identified problems in their departments. The researcher trained research assistants who did hard real practical work of data collection in pre-post intervention phases.

5.9 Lessons learned during project implementation

For the efficiency and effectiveness of the project implementation, the researcher must analyses well the root causes of the problem, select the best strategy, skilled in all SPS steps, to have a good committed and collaborative research teamwork. Delegation of powers is very crucial since in the absence of the researcher the focal person might help the research team for decision making. Well-implemented quality improvement projects are the bench makers for achieving institutions objectives and prizes implementers.   There must be reliable regular evaluation process for the progress of project implementation if necessary; you may change an intervention when realized in time. Implementing for quality improvement projects does not need many resources but deserves reasonable means in data collection, sourcing academic materials, office stationery and so forth.

5.10 Limitations in project implementation

During data collection, it was challenging to get committed research assistants who would complete eight days from 7am to 6pm without compensations. Due to time constraints, we used one intervention strategy instead of two or more interventions. It was a complicated period to combine MHA course programs, daily hospital work without official study leave and self-sponsorship. Some people had feelings that all research projects must have financial support; therefore, we negotiated deeply to get their assistance. The researcher had limited skills in some

computer software, which would block or limit the student to exhaust skills appropriately. Low rate of conducting quality improvement projects at the hospital resulted into energy consuming to implement the study project.

CHAPTER SIX: CONCLUSION AND RECOMMENDATION

6.1 Conclusion

Patients waiting time is the fundamental tool that help healthcare facilities to measure service seekers' satisfaction towards the quality of healthcare service provided. The pre-intervention findings of the current study have found out that outpatients at OPD of Gahini district hospital spent long time waiting for healthcare services and some took overnight. This was due to staff noncompliance with OPD schedule that is to say some could come late and leave at any time from the service station, no provision of fulltime services, observed internal arrangement among staff, on and off permissions among others. The purpose of the study was to reduce outpatients long waiting time by training staff on time management for complying with their daily work schedule.

The project team selected and implemented the best intervention after the processes of root causes analysis (RCA). The best intervention was focusing on improving the length of time that outpatients spend to receive healthcare services. Thus, the overall average waiting time decreased from 400min (6.40 hours) to 193min (3.13 hours). After intervention findings showed good achievement in the project implementation. Therefore, the project taskforce team must continue to implement the intervention aiming to attain normal waiting time standards. Reducing patients waiting time is a complex issue because of many determinants, thus, the hospital would use multidisciplinary strategy approach to combat that problem. Among suggested feature interventions, include staff training on staff scheduling problems, staff retention activities, adapting policies on time management, advocacy for staffing and among others for overtime project sustainability.

6.2. Recommendations

1. Train Healthcare professionals on time management and the importance of staff compliance to the duty roster for reducing long waiting time that spent by patients at OPDs.

2. Continue to implement the current strategies used to reduce patients' long waiting time for overtime sustainability of the current project.

3. Conduct similar studies at district hospitals on patient long waiting time at OPDs, which inspire the healthcare facilities to know the general situation of patient waiting time.

4. Carryout comparative study on long waiting time between OPD of Gahini hospital and any other district hospital in Eastern province.

5. Establish convenient way of reporting poor quality service delivery especially long waiting time at outpatient department in the healthcare facilities.

6. Reinforce staff accountability measures as far as time management and service delivery at OPD are concerned in order to satisfy service consumers.

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APPENDICES

Appendix I: Timesheet tool for data collection

WAITING TIME SURVEY AT GAHINI HOSPITAL   **LAB No:**

Adapted Timesheet for measuring waiting time at OPD

Facility Name:			Date:	Patient No:
Arrive Time				
Services section	**Time in service**	**Time out of service**		
Photostat Machine				

CBHI Agent				
Reception				
Nurse takes vital signs				
Doctor's consultation room				
NCDs consultation room				
Laboratory				
Medical imaging				
Doctors reviews results				
Review results for NCDs				
Cashier				
Pharmacy				
Departure time:				

Comment:

Appendix II: Research assistants' card

Appendix III: Tally sheet used to verify queue discipline

Service unit	Date				Total
CBHI					
Reception					
Nurse vital signs					
Doctor consultation rom 2					
Doctor consultation room 3					
Cashier counter					
Total					

Appendix IV: Tally sheet for verifying clinic staff turnover

Description	Month of the year				Total
Doctors					
Nurse					
Laboratory Technician					
Total					

Appendix V: Tally sheet for verifying logistical problem

EQUIPMENT	OPD SERVICE UNIT																		PERCENTAGE		
	RECEPTION			NURSE			CONSULTATION			NCDs			MED IMAING			CASHIER COUNTER					
	O	D	R	O	D	R	O	D	R	O	D	R	O	D	R	O	D	R	A	N	%
Computer																					
Printer																					
Chair																					
Bench																					
Table																					
X-ray machine																					
Ultra-sound machine																					
UPS																					
Microscope																					
Fridge																					
Chemistry analyser																					
Hemotology analyser																					
Room																					
Height scale																					
Weight scale																					
Thermometer																					
Sphygmomanometer																					
Blood glucose meter																					
Stetoscope																					
Pulse oximeter																					
Cardiac ultrasound																					
Televiosion																					
GENERAL TOTAL																					

Where, **O:** stands for operating items

D: stands for damaged items

R: stands for required items

A: for total available items in the service stations

N: for total needed items in the service stations Appendix VII: ethical clearance letter