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Assessment of Physicians' and Nurses' Satisfaction towards Clinical Laboratory Service in Selected Public Hospitals,Addis Ababa,Ethiopia

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A thesis Submitted to Department of Medical Laboratory Sciences, School of Allied Health Sciences, College of Health Sciences,Addis Ababa University in Partial Fulfillment of the Degree of Masters in Clinical Laboratory Science (Clinical Laboratory Management and Quality Assurance)

July, 2018

Addis Ababa

Addis Ababa University

School of Graduate Studies

This is to testify that the thesis is prepared by MaijiTesfaye, which is entitled "**Assessment of Physicians' and Nurses' Satisfaction towards Clinical Laboratory Service in Selected Public Hospitals, Addis Ababa, Ethiopia** and submitted in partial fulfillment of the requirements for the degree of Master of Clinical Laboratory Sciences (Clinical Laboratory Management and Quality Assurance) complies with the regulations of the University and meets the accepted standards with respect to originality and quality.

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Acknowledgment

I thank my advisors Dr Aster Tsegaye, Mr. Adinew Desale, Mr Alemayehu Nigatu and Dr Yitagesu Getachew for their support and guidance. AlsoAddis Ababa University College of Health Sciences, School of Allied Health Sciences, and Department of Medical Laboratory Sciences is acknowledged for the given opportunity. My heartfelt thanks go to the study participants for their kind participation and my family for all the support.

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Abbreviations

AOR…….Adjusted odds ratio

ART----------Antiretroviral therapy

CAP----------College of American Pathologists

CI----------Confidence interval

GP----------General Practitioner

HIV----------Human immunodeficiency virus

HO----------Health officer

ISO----------International organization for standardization

NCQA----------National committee on quality assurance

OPD----------Outpatient department

OR----------Odds ratio

QA----------Quality assurance

SD----------Standard deviation

SOP----------Standard operating procedure

SNNPR----------South Nations and Nationalities People Region

TAT----------Turnaround time

USA----------United States of America

WHO----------World Health Organization

Abstract

Background: A comprehensive care and treatment program requires a well-functioninglaboratory services. Measurement of physicians' and nurses'satisfaction is essential for evaluating the delivery of health care andfor assessing patient outcomes.It is also as an important indicator of quality of care and a major component of laboratory quality assurance program.

Objective: To assessphysicians' and nurses' satisfaction towards laboratory service among selected public hospitals in Addis Ababa, Ethiopia

Methods: a cross sectional study wasconducted in 4 selected hospitals in Addis Ababa, involving 402physicians and nurses.

Quantitative and Qualitative data were randomly collected from the four selected hospitals proportionally. Volunteering physicians and nurseswere included. Questionnaire was developed based on the format from published articles.SPSS version 20was used for data entry and analysis. Five point Likert Scale was utilized. Mean score calculated and satisfaction were determined based on scores equal and above to the mean. Frequencies and proportions calculated. Odds ratio with confidence intervals and P values less than 0.05 was used to determine the direction and strength of the association. Test statistics with chi square was used

Result: Data werecollected from 132 physicians and 270 nurses. The mean satisfaction score was 3.0. Overall satisfaction for physician and nurses on clinical laboratory service were 64%. The highest rate of satisfaction was on availability of the staff during working hour(74.9%)and location of the laboratory(70.9%) followed by cleanness and organization of the room (69.1%), reporting of complete test result (69%). Less satisfaction rates were identified for consistency of the overall laboratory service (34.3%), panic result notification (37.9%), adequate test menu on test format (38.3%), and compatibility of laboratory result with patient condition (55.9%). In-depth interview of physicians revealed that consistency of overall laboratory service and critical result notificationare the main area of dissatisfaction.

Conclusion and recommendation: The overall degree of professional's satisfaction with laboratory services was good. But further analysis is needed to identify the source which can affect the consistency of the overall laboratory service. Therefore, the hospital administrations, health bureau and ministry of health should focus on the identified gaps.

Key words: *Satisfaction, Clinical laboratory Service*

1. Introduction

1.1 Background

Hospitals have expanded in terms of availability of specialties, improved technologies, facilities and increased competition while the expectations of patients and their relatives have increased many fold. Consumer expectation in any medical experience influences whether how soon and how often they seek care and from which medical facility. High expectation from a medical organization is a positive indicator of its reputation in the society and is very important for attracting patients, Whereas, low expectation deters patients from taking timely medical help, thus, negatively affecting them as well as the medical care provider(1).

Clinical laboratories are a part of the medical service that is routinely used in clinical practice to improve diagnosis and patient treatment in health care. This includes a public health role in detection, prevention, and control of communicable disease(2). Quality medical laboratory service provision is important in order to enhance diagnostic value and save lives. This is because recognition of disease is the foundation of disease control and prevention. Unfortunately, the implementation of quality laboratory service in many resource poor countries has been unsystematic and is still questionable.Although medical laboratory service provision is a well-developed science and laboratory tests significantly alters diagnosis and treatment observations indicate that many laboratories turn out dangerously inferior work resulting in inaccurate determinations and failure to identify the causative agents in samples (3).

Quality of care is an important aspect of health care delivery system that is given a priority. Variation in quality of care between different health care facilities is thought to reflect differences in efficiency and other organizational factors.Quality is an increasingly becoming an important aspect of health care that is given a priority now a days (4).Research has shown that good service quality leads to the retention of existing patients and the attraction of new services, reduced costs, an enhanced corporate image, positive word-of-mouth and, ultimately enhanced satisfaction. Studies in the developing world have shown a clear link between patient satisfaction and a variety of explanatory factors among service quality has been prominent(5).

Laboratory quality can be defined as accuracy, reliability and timeliness of reported test results. The laboratory results must be as accurate as possible, all aspects of the laboratory operations must be reliable, and reporting must be timely in order to be useful in a clinical or public health

setting (6). Quality is a vital in the diagnostic service of clinical laboratories for multiple perspectives like health improvement, customer satisfaction,cost, time and labor effectiveness waste minimization(7).

Satisfactionis defined as a consumer's emotional feelings about a specific consumption experience. It is judgment that a product or a services feature, the product or service itself, provide a pleasurable level of consumption related fulfillment. It has been used by program evaluators to enhance health care providers' ability to render services that meet consumer's need (5).Human satisfaction is a very complex concept that is affected by a number of factors like lifestyle, past experience, future expectation and the values of individual and society in terms of ethical and economical standings(1).

Customer satisfaction is a major component of a laboratory quality management system, and a significant focus in the International Organization for Standardization (ISO) standards. Ultimately, the laboratory produces a product—the test result—for its customers. If the customer is not well served, the laboratory is not achieving its primary function. All laboratory staff must understand the importance of customer satisfaction. Laboratory personnel must always interact with customers in a way that is appropriate, providing needed information, and being courteous (6).

The laboratory has many clients and the needs of all must be carefully addressed. A central figure in the client list is the physician from whom the initial request for service originates and nurses the one mediating the overall health service. In the hospital level the laboratory staff generally identifiesphysicians and nurses as the primary client and their needs must be considered. Theyexpect to have access to accurate, clinically relevant information that can be understood and used in a timely manner. Health professionals need assurance of laboratory responsibility throughout the testing process, including pre-examination steps, the testing process itself and the post-examination process(6).

Thereforemeasurement of physicians and nursessatisfaction is essential for evaluating the delivery of health care and for assessing patient outcomes. Measuring theirsatisfaction level is an important indicator of quality of care because of its relevance to compliance and recall of medical advice(7,8).Assessing customer satisfaction with laboratory service is considered as an important component of laboratory quality assurance program (9).

1.2 Statement of the problem

Monitoring physicians and nursessatisfaction is an important and useful quality improvement tool for clinical laboratories in particular and health care organizations in general. Any laboratory should have a written policy focusing on customer's satisfaction and should periodically measure and evaluate their customer's satisfaction. Though this is not practiced routinely, a number of studies in resource limited settings reported remarkable rates of dissatisfactionin a number of clinical laboratory services(2, 9, 10, 11). Even in the developed world, although there is a continued trend of high physician satisfaction and loyalty with clinical laboratory services, ease of electronic order entry are becoming sources of physician dissatisfaction,representing a new challenge. Moreover, test turnaround times (TATs) are persistent areas of dissatisfaction, representing areas for improvement (12).

Looking from the perspective of test accuracy, the consequences clinical diagnosis without quality laboratory testing often results in significant misdiagnosis and over-diagnosis, leading to inadequate or inappropriate treatment, drug resistance, and increased mortalitywhich greatly affect the satisfaction of the health care providers as well(13). On the other hand problems related to clinical laboratory are aggravated particularly at peripheral level due to lack of properly designed laboratory rooms, shortage of short term and long term training for laboratory staff, lack of water and electricity, shortage of equipment and supplies, absence of effective maintenance and spare parts and lack of follow-up and supervision(14).

In order to actively seek information about how clients view the laboratory's service, it will be necessary to conduct surveys (paper-based or electronic) or to use interviews and focus groups. In this way the laboratory can address specific questions to areas of concern, and can look at areas not commonly covered by complaints or internal processes.ISO standards put a heavy emphasis on the importance of customer satisfaction; customer surveys are required in ISO 9001 standards for quality management systems. Any laboratory that implements a quality management system, whether accredited or not, needs to use some method for surveying clients in order to understand whether needs are being met(6).

Comprehensivequality laboratory services are a challenging process; need multiple sources of supports from clients, providers, managers, and other stakeholders. Especially, needs and preferences of clients in clinical laboratory must be addressed in the design and implementation

of laboratory quality system(15). The laboratory manager should review the feedback and use it to improve the laboratory performance. One of the key and often over looked laboratory quality indicator is physicians and nursessatisfaction survey. Medical Laboratory quality improvement process requires laboratories to communicate certain specificinformation back to medical personnel who referred specimens to the laboratories(10). It is a challenge for the clinical laboratory management to reach and utilize the customer perspective. A generally used method to obtain customer feed-back is to conduct a satisfaction survey. Satisfaction surveys provide satisfaction ratings (16).

However customer satisfaction surveys can be used as a tool to identify factors that contribute to poor laboratory services and are an important component of a laboratory quality assurance.previousphysicians and nursessatisfaction surveys with laboratory services have not beendone in Addis Ababa. Therefore, this study will assess satisfaction of physicians and nursestoservices provided by public laboratories inAddis Ababa.

Satisfaction survey questionnaires have been criticized for failing to discriminate effectively between good and bad practice as well as attitudes. Problems behind dissatisfaction may not be revealed by surveys alone (17).They have limitations in identifying challenges and potential solutionsso clarifications with selected customers are needed. In this research in order to augment the resultof the study eightphysicians and nurseswere interviewed.

1.3 Significance of the study

Consumer feedback alerts managers to users' needs, perceptions and concerns, identifies areas of service failure, and enables the evaluation of improvements as they are implemented. Customer surveys also encourage professionalism amongst staff, making them accountable for the quality of service they deliver. They provide an incentive throughout the organization to improve performance and a mechanism for identifying individuals who are worthy of reward.

Measuring physicians and nursessatisfaction is important and useful quality improvement tool for clinical laboratory and the health care organization,in general.The findings from this study will help the studied hospitals to identify their gaps and thrive for a better service. In addition to satisfying their clients need, it will help them to remain competent and to get recognition as well as accreditation.

2. Literature review

Today assessing customer satisfaction with laboratory services is considered an important component of a laboratory quality assurance program and is required for accreditation by the College of American Pathologists (CAP) and The Joint Commission on Accreditation for Health care Organizations. Physicians are one of the primary customers of laboratory services and obtaining their feed-back provides laboratory managers with opportunities to identify areas for improvement (18).

Two previous USA satisfaction studies which includes 375 institutions in 1999 and 153 institutions in 2002, 50% of the laboratories surveyed received median scores of 4.0 or higher, with 75% scoring 3.8 or higher in the surveys performed in1999 and 2002.The greatest satisfaction was noted in the areas of staff courtesy, critical value notification, and quality of results, and the least satisfaction in the categories of turnaround times(18).

In the current study conducted in USA 2009, 138 institutions participated and submitted a total of 4329 physician surveys.Most participants were from the United States (97.1%),with the remainder from Australia, Singapore, andSpain. An average of 31.4 surveys were submitted perinstitution (median, 31), with a range of 3 to 50 surveysper institution. The overall satisfaction scores ranged from 2.9 to 5.0, with a mean and median score of 4.1. 75% of laboratories received mean satisfaction scores of 4.0 or higher (out of a possible score of 5) and a median overall performance score of 4.1.All physicians surveyed from 57 of the138 participating laboratories indicated that they would recommend that laboratory to another physician. The remaining 81 laboratories (58.7%) received at least one response in the category ‘‘would not recommend’’ the laboratory. Quality/reliability of laboratory results (analytical quality of results)and courtesy of laboratory staff had the highest median values (89.9%). Accessibility to laboratory staff, manager, and pathologist, and laboratory management responsiveness also had high median percentage values of excellent/good ratings (range, 82.6%–87.6%). Of the 5 service categories that received the lowest median values for percentage of excellent/good ratings (combined scores of 4 and5), 4 of these related to turnaround times for inpatient STAT, outpatient STAT, routine, and esoteric tests (18).

A satisfaction survey was carried out in the clinics of Oulu University Hospital in2001, Oulu, Finland, The highest percentage of disagreement (35.9%) was related to missing test results. In

addition, there was a high percentage of dissatisfaction with the laboratory information system when reviewing the laboratory results (30.8%), and with the turnaround times of both STAT tests (28.4%) and routine tests for in-patients (26.5%). The respondents needed additional instructions on the preparation of patients for laboratory tests(27.3%) and on the collection and handling of samples(27.8%). Approximately 25.9% needed additional consultations by laboratory physicians. The use of Laboratory Users' Handbook was criticized by 22.4% of the respondents, and about 21% were not satisfied with the schedule of phlebotomy rounds(17).

A study conducted in the laboratory of a specialized fever hospital affiliated to the Ministry of Health in Alexandria, Egypt involved all working physicians in the hospital. The highest excellent rating of all laboratory service categories was for staff courtesy (43.1%),which had the highest mean satisfaction score (4.20), followed by quality or reliability of results(21.5%). The highest poor ratings of the laboratory service categories was for laboratorymanagement responsiveness, outpatient stat TAT and critical value notification (10.8%, 7.7%,7.7%), respectively. The lowest mean satisfaction score was for outpatient stat TAT and clinicalreport format (3.26) followed by routine test TAT (3.31) The mean satisfaction score of physician in this study was 3.46 (on a scale of 1–5)and the median was 3.45 (19).

Anobservational, cross-sectional study conducted to assess the level of physician satisfaction with the laboratory services of 6 hospitals (3 public and 3 private) in Aden Governorate, a total of 207 physician surveys were distributed to the 6 institutions under study. The overall mean for physician satisfaction score ranged from 2.42 to 4.00; the median score for physicians was 3.48. the highest rating was "good": phlebotomy services (44.7%), courtesy of clinical laboratory staff (38.5%) and clinical report format (27.3%). Quality and reliability of results had "below average" as the highest rating (30.4%). The highest proportion of "poor" ratings was for the esoteric test TAT (55.3%) and notification about the new investigations (36.0%).The most important laboratory service category was mentioned to be quality and reliability of results (54.4%), followed by routine TAT, stat TAT and critical value notification (8.2%)(20).

A study conducted Tanzania 2007, includes a total of 24 health facilities with laboratory services, in Tanzania mainland.A total of 235 out of expected252 medical personnel others than laboratory technicians were interviewed, and 196 records of the personnel were valid for analysis of the satisfaction with laboratory services. A total of 15 laboratory technicians were

interviewed. About three quarter of the medical personnel were satisfied with the laboratory services. However the proportion of the Medical personnel being dissatisfied were 38.3% in timely test result, 24.5% in correct and accurate results and 22.4% in clear complete results. Medical personnel working with public laboratories were more dissatisfied with timely test results (OR = 3.6, 95% CI 1.8, 7.3), correct results (OR =4.1, 95% CI 1.6 – 10.8) and Clear Complete results (OR =5.0 95% CI 1.6, 15.2)(10).

A study conducted in Nekemte referral hospital in 2014,included 105 health professionals the overall satisfaction was 62.86%,30% of the respondents were neutral and 8% were dissatisfied. The higher satisfaction was observed on the location of the laboratory, cleanness of the room,staff courtesy and improvement of laboratory service with a mean rating of 3.82,3.84,3.81,3.76 respectively. Healthcare providers in the study were less satisfied with critical value notification, adequacyof materials,getting urgent samples on time, adequacy of laboratory test menu on request format 3.36,3.46,3.33,3.27 respectively. The overall mean rate of satisfaction was 3.58(21).

The study conducted in the laboratory service department at Gondar University Hospital 2012and reported in involving randomly selected 131 nurses and 64 physicians.51.3% of the study participants were satisfied with the activities of the laboratory. The level of satisfaction across the 2 professions was similar: 51.1% for nurses and 51.5% for physicians.67% of the physicians were dissatisfied with the quality of work. Dissatisfaction rate by physicians with the availability of requested tests was50%, with the reporting of reference ranges 48%,with the clinician handbook 48%, and 44% with the timely reporting of critical values. On the other hand, nurses were dissatisfied with the accessibility of laboratory results (58%), the compatibility of laboratory results with the patient's condition (51%), the reporting of reference ranges (46%). Turn-around time was mentioned as an area of dissatisfaction by61% of physicians and 62% of nurses. Physicians were relatively more satisfied with the ease and clearness of reports and the ease in understanding the clinician handbook but were statistically more dissatisfied with the compatibility of results with the patient's condition and the consistent quality of the laboratory work(22).

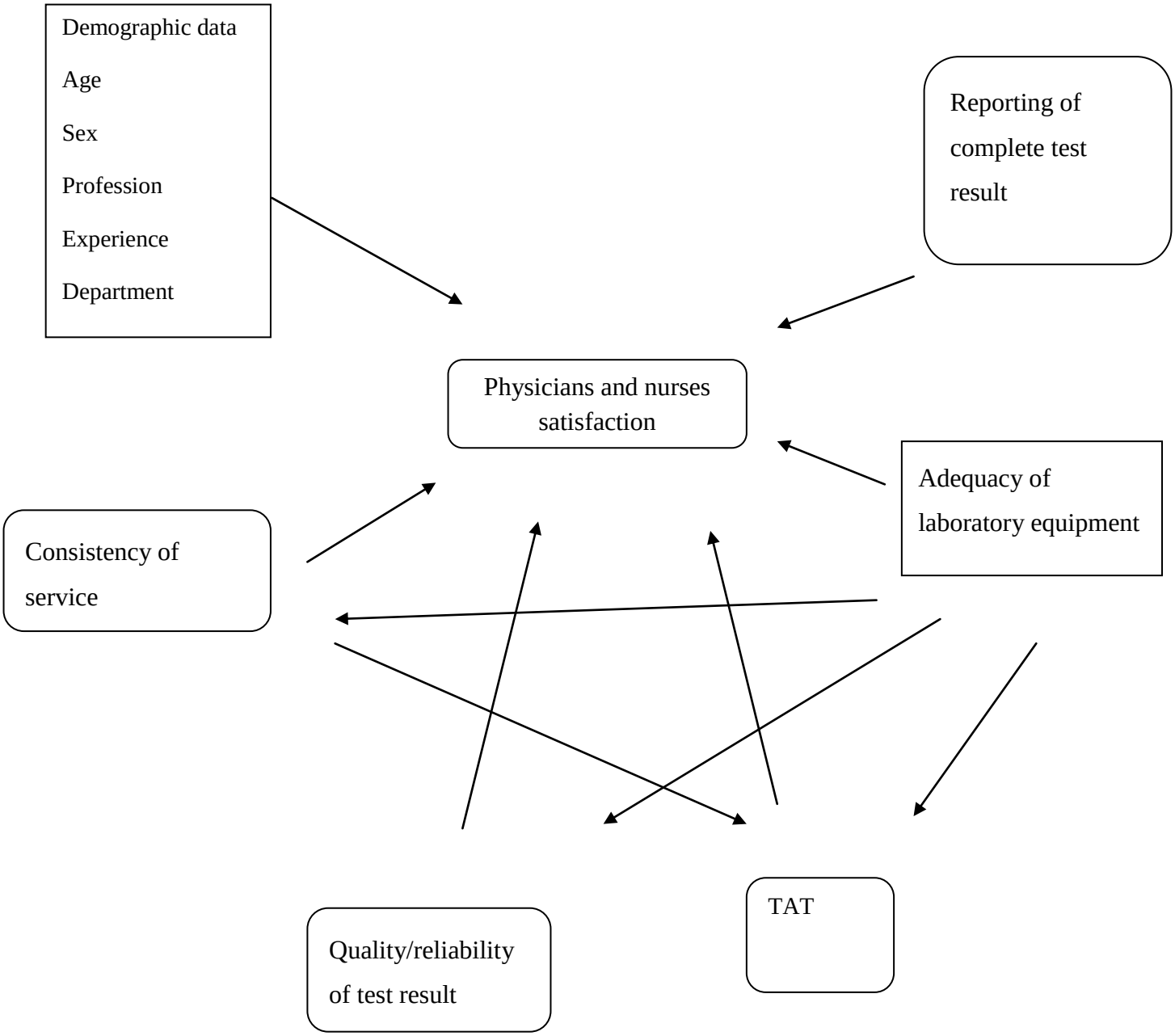
A study conducted in South Nations and Nationalities People Region SNNPR, 2014evaluated the satisfaction of medical practitioners in clinical laboratory services. The survey was undertaken in

19 health institutions in the SNNPR. Surveys from 290 medical practitioners were collected from 19 health institutions .In the survey,The mean (SD) overall satisfaction score was 3.36 (0.87). The highest percentage for the excellent/good rating was reported for clarity and readability of results (76.0%), followed by professional manner (73.3%), critical value notification (73.0%), and knowledge (72.9%). The highest rating for below average/poor (less satisfaction) was reported for blood bank service (36.6%), followed by availability of senior laboratory experts (33.1%). Similarly, the lowest percentage of excellent/good ratings was reported for the blood bank service (42.9%) and availability of senior laboratory experts(44.8%)(23).

A cross section al study which conducted in eastern Ethiopia included DilChora ,HiwotFana , Jugal and Bisidimo Hospitals , 2010 showedthe overall percentage of satisfied clinical services providers by the laboratory services was 80.0%. Based on responses from Likert Scale, overall mean rate of satisfaction was3.49 ± 1.27. The highest rate of satisfaction was observed on timely test result s for HIV/AIDS patient s care. The lowest rate of satisfaction was observed on critical value notification and on reportingof complete test result s (24).

As reviewed above, different rates of satisfaction have been reported in the various areas of the clinical laboratory services. Thus far published studies from hospitals in Addis Ababa on the satisfactionrate of physicians and nurses is lacking and hence, this study aimed to fill this gap so that the studied hospital laboratories could use the information for quality improvementactivities.

Conceptual framework



3. Objective

3.1. General objective

To assessphysicians and nursessatisfaction towards laboratory service among selected public hospitals in Addis Ababa,Ethiopia

3.2. Specific objectives

- To determine the level of satisfaction of physicians and nurses
- To determinefactors affecting satisfaction level of physicians and nurses on clinical laboratory services.

Hypothesis; This study will answer the question what factors are affecting physicians and nurses satisfaction level towards laboratory service by setting a hypothesis; factors affecting satisfaction level are similar across physicians and nurses .

4. Material and methods

4.1 Study area

The study was conducted in St Pauls' Hospital Millennium Medical College, Menilik II Hospital, Ras Desta Damtew Memorial Hospital and St Peterspecialized hospital in Addis Ababa,The hospitals were located in Addis Ababa. Two of them are under the administration of Addis Ababa City Administration Health Bureau (Minilik and Ras Desta), while the remaining are under the Federal Ministry of Health. the hospitals (St Paul,Menilik II,Ras Desta,St Peter)have total number of staffs (2418,809,587,668) respectively.St pauls have the highest number of specialists 158 the others(30,18,10) is for Mennilik II,Ras Desta,St Peter respectively.St Pauls have 288 GPs,MennilikII have 35 and (43,90) is for Ras Desta and St Peter. The hospitals (St Pauls,Mennilik,Ras Desta,St Peter) have 690,331,192,172nursesrespectively.The above listed hospitals were selected because there are no published studies that can be found on physicians and nurses satisfaction towards laboratory service in accessible scientific journals in these hospitals.

4.2. Study design and period

A cross-sectional study was carried out from December 01,2017 to March 30,2018.

4.3 Population

4.3.1 Source population

Allphysicians and nurses working in the selected hospitals werethe source population. In addition, randomly selected physician and nurses wereenrolled for in-depth interview.

4.3.2 Study population

All volunteering physician and nursesand fulfilling the Eligibility criteria were the study population.

4.4 Eligibility Criteria

4.4.1 Inclusion criteria

All physicians' and nurses' who have one year and above year of service during the study period

4.4.2 Exclusion criteria

-Interns

4.5 Study Variables

4.5.1 Dependent variable

-Satisfaction rate of physician and nurses by service areas

4.5.2 Independent variables

- Socio-demographic characteristics
- Service year
- Job category(physicians, Nurses, Residents)
- Location of the laboratory in the hospital
- Cleanness and organization of the room Phlebotomy service
- Consistency of overall laboratory service
- Adequacy of test menu on test format
- Adequacy of laboratory equipment
- Inpatient sample TAT
- Routine test TAT
- Critical result notification
- Availability of staffs during working hour.

4.6 Sample size determination and sampling procedure

4.6.1 Sample size determination

The sample size was calculated by using single population proportion formula of physician and nurseswith overall satisfaction rate of 50%

Therefore the required sample size n at confident interval of 95% and marginal error 0.5% with non-response rate 10% is:

$(Z\alpha/2)p(1-P)/d^2$

Where:n is sample size,

Zα/2 is the value of Z from critical value 1.96, 95% confidence interval(CI)

P is the proportion of 50%

d2 is the margin of error0.05

n=(1.96)2(0.5(1-0.5)/(0.05)2=384

384+10% of non-respondent rate=Total

Final sample size will be **402**.

For the qualitative study randomly selected physicians with 5 and above years of experience were selected until saturation of ideaswere achieved.

4.6.2 Data collection procedure

Data was randomly collected from the four selected hospitals proportionally allocated to physicians and nurses based on number of respective staffs. Volunteering physicians and nurses were included. Questionnaire was developed based on the format from published articles (9, 18,20). Since the study populations arephysicians and nurses the questionnaire was in English and self-administered.Threedata collectors were selected qualified in bachelor of health science(three nurses)

Training using lecture and demonstrationon data collection procedure and supervision was given for two days.

Questionnaire was pretested at different facility and data was collected at the study hospitals.Draft of data collection guideline was developed and data collection procedure was stipulated between data collectors, supervisor and principal investigator which served for the study period.

Data collection for in depth interview was done by the principal investigator using open ended questionnaire and tape recorder during the study period. Each in depth interview was in English and took 15 to 20 minutes. Duration of interview days and sample size was determined by saturation of ideas during data collection period.

Forthe qualitative study 06 eligible participants were selected and sample size was determined since saturation of idea was achieved on the 6^{th} participant.

4.7 Data Quality Assurance

The questionnaire was tested on 10% physicians and nurses working in facility other than the selected hospitals.Adjustments were made accordingly based on feedback. Questionnaire was checked for completeness,accuracy and consistency and corrective action was undertaken with the team.

4.8Data analysis and interpretation

The questionnaire had a total of 26 questionsincluding those on socio-demographic characteristics of the participants (6questions), level of satisfaction with clinical service (15 questions), level of satisfaction by department(5questions). After data collection, the data was coded on pre-arranged coding sheet by the investigator and the corresponding code number was written at each questionnaire margin and data entry was done using SPSS version 20. Template scheme for data entry was developed and pre tested for ranges and allowed legal values. Any error was identified before analysis by revising entered data and original data's code number and statistical commands.

A 5 point Likert Scale rating of very satisfied (1-point), satisfied(2-point s), neutral (3-point s), dissatisfied (4-point s) and very dissatisfied (5point) were used.

Overall mean satisfaction score = (No. of very satisfied ratings × 5) + (No. of satisfiedratings × 4) + (No. of neutral ratings × 3) + (No. of dissatisfiedratings × 2) + (No. of very dissatisfiedratings × 1) for overall satisfaction/total No. of ratings (1-5) for overall satisfaction with laboratory services

Frequency distributions in tables and graphical presentations were presented. Moreover, the overall association between the different factors and the outcome variables was done using chi-square test at ap value of<5%.

To identify associated factors first a bivarate logistic regression was done for each independent variables with the outcome of interest.Finally multivariate logistic regression was used.

Data collection for in depth interview was done by the principal investigator using structured open ended questionnaire and tape recorder during the study period. Preliminary coding for

diverse opinions using codes, categories and themes directly related to the study objective were used. Data was compiled and summarized using open code software.

4.9 Ethical considerations

Approval to conduct the study was obtained from the research and ethics committee of department of Medical Laboratory Sciences of Addis Ababa University. Each participant (physicians and nurses) were informed about the purpose of the study, their right to withdraw from the study anytime or to withhold information. Confidentiality of data was maintained through keeping hardcopies locked and electronic data password protected.

4.10 Dissemination

The findings of the study will be presented to Department of Medical Laboratory Sciences, College of Health Science, Addis Ababa University. Thesis will be submitted to serve as a reference. Moreover, the output of the results will be communicated to the study sites for their appropriate action. Findings will be communicated to the wider medial/scientific community through presentation during annual conferences. The results of the study will be submitted to peer review journals for publication.

4.11 Operational definition

- **Satisfaction:**clients' opinion of service received from hospital laboratory services or staff and is acknowledged as an outcome indicator of quality of service. In this study mean satisfaction scores was taken as cut point to categorize respondents as satisfied or dissatisfied (physicians and nurses are said to be satisfied when their mean score is above the mean).
- **Turnaround time:** is defined as the usual amount of time between the time a specimen is received within the laboratory and the result is available.
- **Critical value:** Panic value which has to be reported immediately as per the SOP of thelaboratory

5. Result

5.1 Socio-demographic characteristics of the study participants

A total of 402 physicians and nurses participated in this study among the study subjects 181(45%) were male and 221(55%) were female.Majority of the respondents were in the age range of 20 to 31 (70%) followed by 31to 40 (20%).Out of the 402 respondents, 49.2% were single and 49% were married the others were divorced and widowed. Concerning their educational level majority of the respondents (270)were nurses and 132 physicians of which 67.9% have BSc,25.9% MD and 6.2% have specialty certificate.The participants served the hospital for a minimum of 1 year and a maximum of greater than 21 years, with the majority (71.4%) serving 1 to 5 years while (19.2 %) served 6 to 10 years (Table 1).

Table 1 Socio demographic characteristic of respondents in four public hospitals, Addis Ababa, 2018

Variables	Number (n=402)	Percentage (%)
Sex :		
Male	181	45
Female	221	55
Age in group (years):		
20-30	282	70.1
31-40	80	19.9
41-50	29	7.2
51-60	11	2.7
Marital status:		
Single	198	49.3
Married	197	49.0
Divorced	5	1.2
Widowed	2	0.5
Level of education:		
BSc	273	67.9
MD	104	25.9
Specialty certificate	25	6.2
Experience (years)		
1-5	287	71.4
6-10	77	19.2
11-15	12	3.0
16-20	11	2.7
>=21	15	3.7

5.2 Degree of satisfaction of physicians and nurseson clinical service

Degree of satisfaction was determined by computing mean score.The overall mean satisfaction score for the laboratory service provision was 3.0. Physicians and nurses were said to be satisfied when their mean score is above the mean. Accordingly, 64.5% of the study participants were satisfied with the activities of the laboratory.The highest satisfaction was observed on Staffs availability during working hours (79.4%), location of the laboratory (70.9%), cleanness and organization of the room (69.1%), reporting of complete test result (69%). They were less satisfied with consistency of the overall laboratory service, panic result notification, adequate test menu on test format, compatibility of laboratory result with patient condition (34.3%, 37.9%,38.3%,55.9), respectively (Figure 1). Detail is shown in Table 2.

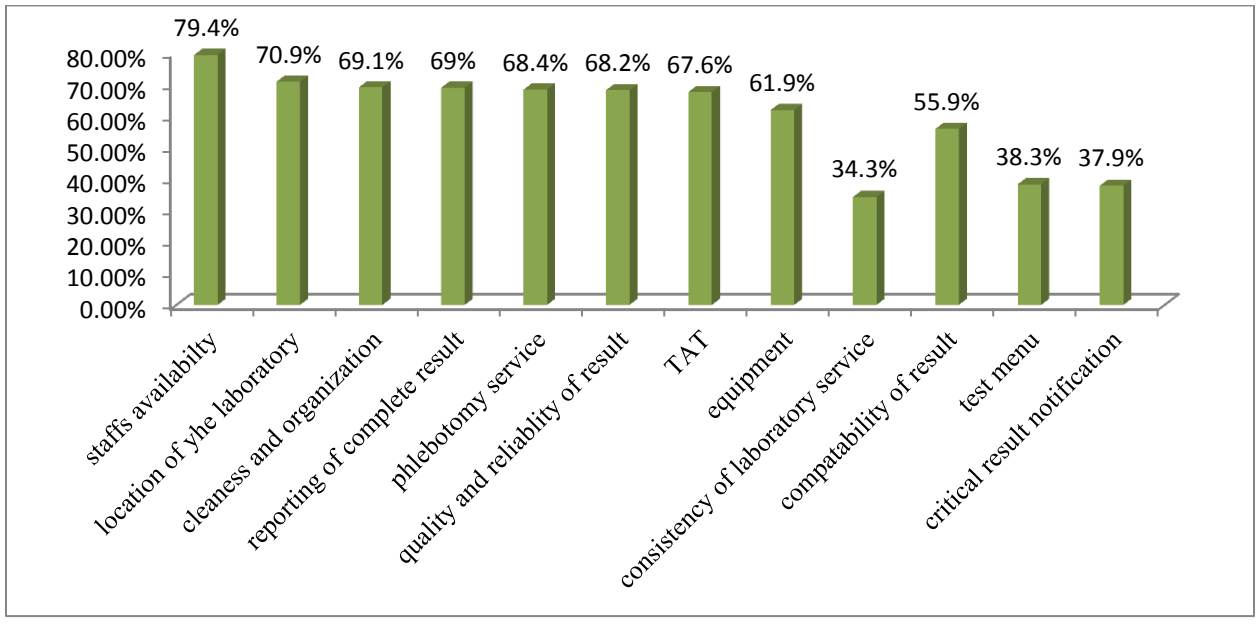


Figure1.Physicians' and nurses' satisfaction with the laboratory service.

Table2. Satisfaction level of physicians and nurses with the laboratory Servicein four public hospitals,, Addis Ababa, 2018

Variable	Verysatisfied No. (%)	Satisfied No. (%)	Neutral No.(%)	Dissatisfied No.(%)	Very dissatisfied No.(%)
Location of the laboratory	30(7.5)	117(29.1)	138(34.3)	87(21.6)	30(7.5)
cleanness and organization	19(4.7)	134(33.3)	125(31.1)	102(25.4)	22(5.5)
Phlebotomy service	19(4.7)	98(24.4)	159(39.5)	93(23.1)	32(8.0)
Satisfaction of laboratory equipment	11(2.7)	92(22.9)	146(36.3)	117(29.1)	36(9.0)
Routine TAT	9(2.2)	100(24.9)	164(40.8)	103(25.6)	26(6.5)
Quality and reliability of test result	22(5.5)	112(27.7)	141(35.1)	109(26.1)	18(4.5)
Reporting of complete result	19(4.7)	134(33.3)	125(31.1)	102(25.3)	22(5.47)
Staffs availability during working hour	24(6.0)	153(38.1)	142(35.3)	67(16.7)	16(4.0)
Overall laboratory service	10(2.5)	122(30.3)	143(35.6)	92(22.9)	35(8.7)

5.3 Degree of satisfaction and its association with socio-demographic characteristics

Overall the level of satisfaction across professionals;nurses were more satisfied (73.3%) followed with specialists (60%) andGPs(57.7%).Professionals with higher age (>=51) and females were more satisfied (81.8%,74.9%) respectively than males (60.3%, 81%) of professionals with many experience(16-20)years aremore satisfied than those with minimum experience (Table 3).

Table 3 Degree of satisfaction and its association with socio-demographic characteristicsin four public hospitals, Addis Ababa, 2018

Variables	Level of satisfaction in No.	Percentage (%)
Sex :		
Male	108	60.3
Female	167	74.9
Age in group (years):		
20-30	193	68.4
31-40	53	66.2
41-50	20	69
51-60	9	81.8
Marital status:		
Single	132	48
Married	140	51
Divorced	3	1.09
Widowed	0	0
Level of education:		
BSc	200	73.3
MD	60	57.7
Specialty certificate	15	60
Experience (years)		
1-5	196	68.3
6-10	52	67.5
11-15	8	66.7
16-20	9	81.8
>=21	10	66.7

5.4 Satisfaction level of physicians and nurses by department

As shown in Table 4, physicians and nurses satisfaction level by department was analyzed.They were more satisfied with hematology department (78.1%) followed by bacteriology department (75.9%),serology department (74.6%),andurinalysis and parasitology (74%) department. They were less satisfied with chemistry department(60.4%).

Table 4 Satisfaction level of physicians and nurses by departmentin four public hospitals, Addis Ababa, 2018

Variables	No (%) Very satisfied	No (%) Satisfied	No (%) Neutral	No (%) Dissatisfied	No (%) Very dissatisfied	Above mean score (%)
Chemistry department	11(2.7)	101(25.1)	131(32.6)	119(29.6)	40(10.0)	60.4%
Hematology department	23(5.7)	176(43.8)	115(28.6)	67(16.7)	21(5.2)	78.1%
Serology department	15(3.7)	153(38.1)	132(32.8)	82(20.4)	20(5.0)	74.6
Bacteriology department	29(7.2)	153(38.1)	123(30.6)	78(19.4)	19(4.7)	75.9
Urinalysis and parasitology department	20(4.9)	150(37.3)	128(31.8)	78(19.4)	26(6.5)	74.0

Table 5 Satisfaction level of physicians and nurses in four public hospitals, Addis Ababa, 2018

Satisfaction level by service area		
Service area	**Satisfied(%)**	**Dissatisfied (%)**
Menellik	51.3	48.7
Rasdesta	28	72
St paul	24.1	75.9
St peters	37.5	62.5

5.5. Bivariate analysis of satisfaction and associated factors

The chi-square test showed there arestatistically significant associations between outcome variable satisfaction and female sex[AOR=1.92 (1.21, 3.04) P 0.006)]from the bivarate analysis. Otherwise, there is no significant statistical association between outcome variable satisfaction and independent variables;age, marital status, educational level, experience, location, cleanness and organization, phlebotomy, consistency, test menu, equipment, TAT, quality and reliability ,completeness of reporting, compatibility of result, availability of staffs, overall laboratory service and different departments .

5.6Findings from the qualitative data

In-depth interview was carried out until responses were saturated. Accordingly, through an open-ended question, physicians were asked to indicate which factors they think are affecting the quality of the laboratory service that are needed to be improved. The most important factors were on inadequate test menu mostly affecting the outcome of the patient's health. The available tests may be discontinued frequently because of shortage of reagents and equipment malfunctioning.Moreover, most respondents retreats the national policy on procurement of supplies is through one chain by PFSA(pharmaceuticals fund and supplies agency) which limits hospitals to procure by their own from other suppliers and shortage of foreign currencies are reported reasons for lack of supplies. They stated that, in public hospitals the number of laboratory professionals are not proportional to the magnitude of service given and because of this they are unable to provide not only good customerservice but also unable to give attention about quality of the sample and urgency of the test.

6. Discussion

This study aimed at determining the satisfaction of physicians and nurses on the laboratory service using 5 point Likert scale. The overall mean satisfaction score reported for the laboratory service provision in this study was 3.0 which is less than that reported from similar studies in Nekemte referral hospital western Ethiopia which was 3.58 (21), in eastern Ethiopia (3.49) (24),and also not far from the study reported in southern Ethiopia3.36 (23). This significant decrease on satisfaction may be due to high expectation of the professionals to the laboratory service given in Addis Ababa than in regional cities. Most of the hospitals are the main referral hospitals in the city having many skilled and highly educated professionals with capacity of requesting many laboratory tests. Hence, they may not be satisfied with the tests that they find in the laboratory. Professionals in public hospitals are forced to refer those testswhich the

laboratory cannot provide to private diagnostic centers with several test menus and better TAT affecting their satisfaction level.

Overall satisfaction of this study again is less than these two studies conducted in Egyptwith mean score of (3.46) and United States (4.1) this could be due to differences in availability of human resourceNumber of professionals in their case are proportional to the service given. They also provide continuous training to the staffs and continuous staff motivations which helps to minimize knowledge gaps. Physical resources specially highly advanced equipment with better results and better TATs are available (18,19).

In this study the level of satisfactionacross two professionals; nurses were more satisfied than physicians this may be due to frequent exposure to the laboratory service of physician than nurses.Professionals with higher age and with more experience were more satisfied than their counterparts this finding is similar with study conducted in Nekemte hospital and study conducted in southern Ethiopia. However there is statistical significant association between satisfaction and sex of the participants females[AOR=1.92 (1.21, 3.04) P 0.006)] were more satisfied than males (21,23).

The higher satisfaction was observed on location of the laboratory (70.9%) and cleanness of the room(69.1%) ,this result is almost similar with the finding fromNekemte hospital location of the laboratory (74.9%) and cleanness of the room (71.43%), and also the finding from EgyptThe possible reason forslight decrease may be because the hospitals in this study are old and their laboratories were not considered to be nearer.This hospitalshave huge capacities to give service to many patients that come from AddisAbaba and around regional cities so they are very crowded (19, 21).

The lowest rate of satisfaction was observed on critical valuenotification. This is almost similar with the finding from the study in eastern Ethiopia and Egypt. Consistency of the overall laboratory work(34.3%) and adequacy of the test menu(38.3%) are also the main area of dissatisfaction may be becauseit is more common to find discontinued tests due to lack of timely maintenance of equipment and shortage of reagents which finally can affect the consistency of the overall laboratory service (19,24).

The higher satisfaction was observed on department of hematology and bacteriology and lowest satisfaction was on clinical chemistry departmentmay be due to inadequate test menu and inconsistent availability of reagent.

Findings from the qualitative data showed improvements should be taken on laboratory communication withprofessionals speciallyduring major events like test discontinuation, equipment malfunctioning, shortage of reagent, critical result notification. These are the main issuesbecause it helps the physicians to make timely decisions and readiness of the physician to make other alternative measures for diagnosis. It is also one of the requirements byWHO and ISO(2).

7. Strengths and Limitations of the study

The strength of this study is, it tried to diverse opinions on satisfaction level with regard to clinical laboratory services in Addis Ababa using four study hospitals, health professionals are considered as customers of laboratory service than patients where most studies focus on the later as customer. It also complemented the results of quantitative study by using qualitative study.

The limitation of this study did not assess the laboratory staffs awareness about health professional's perspectives towards the laboratory service. In addition, the sample size allocated to each hospital is not large enough to assess the significance level of satisfaction by different variables.

8. Conclusion

The overall degree of professional's satisfaction with laboratory services was good. But further analysis is needed to identify the source which can affect the consistency of the overall laboratory service.

9. Recommendation

The hospital's administrations and the laboratory departments should focus on the identified gaps.Continuous planning and taking timely actions with maximum effort needed in order to deliver quality and reliable heath service. Physician satisfaction should be measured frequently to identifyopportunities for improvement.

The regional health bureau and federal ministry of health have to take feedbacks from respective hospitals in identifying gaps for satisfaction level.

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Annex 1 Information sheet

This questionnaire is prepared to assess physicians and nursessatisfaction towards laboratory service in St Pauls' Hospital Millennium Medical College, Menilik II hospital, Ras Desta Damtew Memorial hospital and St Peter Specialized Hospital AddisAbaba, Ethiopia

Consent form for participation

Good Morning/ Afternoon

My name is _____. I am doing research for fulfillment of master's degree inclinical laboratory management at Addis Ababa University, College of health sciences, School of allied health sciences, and Department of medical laboratory sciences. The aim of the study is to assess physicians and nurses satisfaction towards laboratory service in St Pauls' Hospital Millennium Medical College, Menilik II Hospital, Ras Desta Damtew Memorial Hospital and St Peterspecialized hospital in Addis Ababa. You are chosen randomly to participate in the study and your genuine responses will help to see the truth and find solutions. If you have any questions regarding the study you can contact the principal investigator by the following address.

Maiji Tesfaye

0912-05-18-20

Thank you

Consent form

Your participation in this study is having only few minutes and there is no need to put your name on the questionnaire, no individual response will be reported and it is highly confidential. You will not be denied of any service for refusal in participation. It is your full right to participate or refuse in the study. But your honest participation will have a great contribution to make a difference in the quality of service, so please take a few minute to answer the questions we hope you will participate in the survey since your views are important. If there is anything that is not clear please don't hesitate to ask the facilitator for clarification.

At this time, do you want to ask me anything about the survey?

May I begin the interview now?

Yes----------

No----------

Are you willing to participate in the study?

Interviewer name---------- questionnaire number----------

Date of interview _____ Supervisor's sign _____

Annex 2.Questionnaire

Part IV:Socio-demographiccharacteristics		
S.No	**Questionnaires**	**Response classification**
401	Sex of the respondent	Male…..1 Female....2
402	Age in years	_____years
403	What is your Marital status	Single……..1 Married ……2 Divorced……3 Widowed……4
404	What is your educational level?	Bsc….. 1 MD……2 Specialty certificate ……3
405	How many years of experience do you have	_____years
406	Your current work station/ward	_____
Part V:physicians and nursessatisfaction with Clinical Laboratory Services		
501	How much are you satisfied with the location of the laboratory in the hospital	Very satisfied……..1 Satisfied……..2 Neutral……3 Dissatisfied…….4 Very dissatisfied…….5
503	How much are you satisfied with cleanness and organization of the laboratory room	Very satisfied……..1 Satisfied……..2 Neutral……3 Dissatisfied…….4 Very dissatisfied…….5
504	How much you are satisfied with phlebotomy service	Very satisfied……1 Satisfied……..2

		Neutral……3 Dissatisfied…….4 Very dissatisfied…….5
505	Do you think the overall laboratory work is Consistent	Yes……..1 No ……..2
506	Does the laboratory provides adequate test menu on the test format	Yes……..1 No ……..2
507	How much are you satisfied with equipments in the laboratory	Very satisfied……1 Satisfied…….2 Neutral……...3 Dissatisfied…….4 Very dissatisfied…….5
508	How much are you satisfied with inpatient sampleTAT	Very satisfied……1 Satisfied…….2 Neutral……3 Dissatisfied…….4 Very dissatisfied…….5
509	How much are you satisfied with routine test TAT	Very satisfied……1 Satisfied…….2 Neutral……3 Dissatisfied…….4 Very dissatisfied…….5
510	Does the laboratory immediately notify panic results/ (Critical value notification)	Yes…….1 No …….2
511	How much are you satisfied with quality/ reliability of test results	Very satisfied……1 Satisfied…….2

		Neutral……3 Dissatisfied…….4 Very dissatisfied…….5
512	How much you are satisfied with Reporting of complete test result	Very satisfied……1 Satisfied……..2 Neutral……3 Dissatisfied…….4 Very dissatisfied…….5
513	Does the laboratory results compatible with the patient's condition	Yes……..1 No ……..2
514	How much are you satisfied with availability of laboratory staffs during working hour	Very satisfied……1 Satisfied……..2 Neutral……3 Dissatisfied…….4 Very dissatisfied…….5
515	How much are you satisfied with availability of laboratory manager during working hour	Very satisfied……1 Satisfied……..2 Neutral……3 Dissatisfied…….4 Very dissatisfied…….5
516	How much are you satisfied with overall laboratory services?	Very satisfied……1 Satisfied……..2 Neutral……3 Dissatisfied…….4 Very dissatisfied…….5

517	How much are you satisfied with in clinical chemistry department	Very satisfied……1 Satisfied…….2 Neutral……3 Dissatisfied…….4 Very dissatisfied…….5
518	How much are you satisfied with hematology department	Very satisfied……1 Satisfied…….2 Neutral……3 Dissatisfied…….4 Very dissatisfied…….5
519	How much are you satisfied with serology department	Very satisfied……1 Satisfied…….2 Neutral……3 Dissatisfied…….4 Very dissatisfied…….5
520	How much are you satisfied with bacteriology department	Very satisfied……1 Satisfied…….2 Neutral……3 Dissatisfied…….4 Very dissatisfied…….5
521	How much are you satisfied with urinalysis and parasitology department	Very satisfied……1 Satisfied…….2 Neutral……3 Dissatisfied…….4 Very dissatisfied…….5

Questionnaire for in depth interview

Similar information sheet and consent form was used from the quantitative questionnaire.

Part one

The structured questionnaire for quantitative method and part of baseline characteristic was used.

Part two

Section of interview for physicians and nurses

Sex___ age___ profession_____ year of experience _____

1/ what factors do you think affecting the quality of the laboratoryand the issues that are needed to be improved in the laboratory?

Declaration

I, the undersigned, declare that this M.Sc. thesis is my original work, has not been presented for a degree in this or any other university and that all sources of materials used for the thesis have been duly acknowledged.

Name of the student:

Date _____ Signature _____

Approval of Advisors:

Aster Tsegaye, MSc, PhD

Date_____ Signature _____

FatumaHassen, MSc, PhD fellow

Date_____ Signature _____