



FACTORS ASSOCIATED WITH PATIENT SATISFACTION WITH MEDICAL LABORATORY SERVICES

Aied Abdallah Almalky¹, Abdulwahab Awad Alsulami², Saleh Jaber Almalki³, Faisal Saleh Salem Bin Zaqr⁴, Raheeg Qassim Ali Qahtani⁵, Namah Qaseem Jaber Al Harobi⁶, Abdulaziz Khalaf Mohammed ALrashidi⁷, Ahmad Deayea Ayedh Alresheedi⁸, Mohammad Amer Alrashidi⁹, Ali Mofareh Ali Asiri¹⁰, Mansour Matar Jaman Alzahrani¹¹, Jamaan Sahmi Jamaan Alghamdi¹², Saleh Mrdi Khudhari Alghamdi¹³, Tahani S Ralsan¹⁴, Mohammad Yehyia Noshily¹⁵, Amnah Ali Aman Al Bishi¹⁶, Talal Ali Rashid Alzhrani¹⁷.

Abstract

Background: Laboratory services are an essential component of high-quality healthcare systems and are used to detect diseases of public health importance. Patient satisfaction with laboratory services is critical to proper treatment. Patient satisfaction is an important and commonly used indicator to measure and determine laboratory service levels. Numerous studies conducted in hospitals in different countries have shown low patient satisfaction with laboratory services. This study aimed to assess patient satisfaction with laboratory services and related factors at Mecca Medical Center, Saudi Arabia. Methods: A descriptive cross-sectional study was conducted from January to March 2022. Patient satisfaction with laboratory services was assessed using an interviewer-administered questionnaire from a previous similar study. Statistical analysis was performed using SPSS Version Soft 28 software. Bivariate and multivariable logistic regression were used to assess the relationship between the dependent and independent variables. A P value less than 0.05 was considered a statistically significant association. Results: A total of 414 study participants participated. Systematic random sampling was used to select study participants; 221 (53.4%) were female. About 37.4% of the respondents are between the ages of 29 and 38. The majority of study participants, 245 (58.9%), were satisfied with the clinical laboratory services provided, 135 (32.6%) were dissatisfied, and 35 (8.5%) were neutral. Conclusion: Patient satisfaction was good: nearly six out of 10 patients were satisfied with clinical laboratory services. The availability of all prescribed services and the ability to use services without direct payment increase patient satisfaction, but long wait times for services decrease patient satisfaction.

Keywords: Laboratory service; Patient satisfaction; Multiple logistic regression.

¹⁻² Ministry of health-Health cluster in Makkah-Saudi Arabia

³⁻⁴ Ministry of health-Health cluster in Jeddah-Saudi Arabia

⁵⁻⁶ Ministry of health-Health cluster in Jazan-Saudi Arabia

⁷⁻⁹ Ministry of health-Health cluster in Al-Qassim-Saudi Arabia

¹⁰⁻¹³ Ministry of health-Health cluster in Al-Baha-Saudi Arabia

¹⁴ Ministry of health-Eastern health complex-Saudi Arabia

¹⁵⁻¹⁶ Ministry of health-Health cluster in Jazan-Saudi Arabia

¹⁷ Ministry of health-Health cluster in Al-Baha-Saudi Arabia

***Corresponding author:** Aied Abdallah Almalky

*Ministry of health-Health cluster in Makkah-Saudi Arabia

DOI: 10.53555/ecb/2022.11.8.145

Introduction

Patient satisfaction refers to the perception of the care received compared to the care the patient expected. Assessing patient satisfaction with health care services is clinically relevant because satisfied patients are more likely to adhere to treatment, actively participate in their own care, continue to use health care services, and continue to be treated by health care providers (and there are a few out there). Select) and manage it using a specific system (1, 2). The connection between high-quality healthcare services and a natural quality experience can increase customer satisfaction. Customer satisfaction directly affects the quality of the experience, and of course the quality of the experience leads to customer satisfaction (2).

Customer satisfaction is a major component of the quality management system and an important source of the International Organization for Standardization (ISO). Ultimately, the laboratory process creates a product for the customer that represents the test results. If customer service is poor, the laboratory cannot perform its primary function (3). Furthermore, satisfaction is a psychological state resulting from anticipation or unanticipation. Stimson and Webb suggested that satisfaction is related to perceptions of treatment outcomes and the extent to which they meet patient expectations (4).

Patient satisfaction is an important and commonly used indicator of the quality of any healthcare system (5). Patient satisfaction positively impacts clinical improvement, patient loyalty and retention, job satisfaction, and appropriate clinical care provided by physicians (6). Measuring and improving customer satisfaction with laboratory services are important aspects of laboratory medicine management (7). Patient satisfaction with laboratory services is measured by the quality and professionalism of the staff, adequate information regarding sample collection, time of receipt of laboratory results, availability of prescribed laboratory tests, laboratory space, location of laboratory space, Measured by toilet availability and usage (4, 6). . Client Satisfaction: Provider demonstrates the ability to successfully provide care that meets client needs and desires (7).

Several factors influence customer satisfaction with consumer health services, including customers' sociodemographic characteristics, physical health status, and customer perceptions and expectations of various health services. The overall condition of the health center and the overall appearance of the venue influence overall customer satisfaction (8, 9). Measuring the satisfaction of users of laboratory services is an indicator of the importance of a quality

management system and is required by laboratory quality standards such as ISO 15189:2012 and ISO17025:2017. Research shows that satisfied clients accept treatment and advice, are more likely to return to the health care facility, and pay for services when necessary (8, 9).

Various studies have shown that the reason for patient dissatisfaction in all hospitals is the lack of infrastructure and accreditation system. Poor quality of laboratory services, inconvenience and accessibility, lack of information. Clean toilets, long working hours, wrong results, poor human resource management, poor resource provision, lack of leadership commitment, weak communication system, poor quality assurance management system. Lack of required laboratory services and cost of services are reasons for dissatisfaction (10, 11). One of the biggest problems facing our country today is the lack of quality health care and customer satisfaction, which affects senior officials and employees of the health care system (7, 10).

Satisfied patients will recommend a service they are satisfied with to four to five people, while satisfied patients will complain to twenty or more people. Therefore, evaluating customer satisfaction with laboratory services is an important indicator for improving laboratory service quality. There is insufficient literature on laboratory series regarding the implementation of laboratory services in Saudi Arabia. Therefore, this study aimed to assess patient satisfaction with laboratory services and related factors in a health center in Mecca, Saudi Arabia.

Methods

A descriptive cross-sectional study was conducted from January to March 2022 at a public health center in Mecca, Saudi Arabia. A total of 423 study participants participated in our study; the effective response rate was 97.8% (12). The study was approved by the university ethics committee. All participants signed an informed consent form before answering the questionnaire.

Data collection tools: The structured questionnaire consists of four parts: Part 1 Demographic questionnaire: including gender, age, education status, occupational status and marital status. Part 3, service-related factors; payment methods for services, number of visits to medical centers, distance to medical facilities, waiting time to receive services, opening and closing times of services, attempts to draw blood with a needle, formation of bruises, whether There are medical services available that prescribe testing. Part IV, Facilities addresses: cleanliness of waiting areas, location of laboratories, adequacy of seating

arrangements, cleanliness of blood collection areas, accessibility of sample collection points, location and cleanliness of toilets (13).

Statistical analysis: Data were entered and analyzed using SPSS version 28. Descriptive statistics were calculated to describe the data. A 5-point Likert scale was used, divided into "very dissatisfied" (1

point), "dissatisfied" (2 points), "average" (3 points), "satisfied" (4 points) and "very satisfied" (5 points) using (14). By using a Likert scale, this study attempted to measure laboratory services customer satisfaction with the effective management of their operations (15). The averages are explained as follows:

Value	Rating	Interpretation
5	4.22-5.00	Very satisfaction
4	3.42-4.20	Satisfaction
3	2.62-3.40	Neutral
2	2.82-2.60	Dissatisfaction
1	2.0-2.80	Very dissatisfaction

Each laboratory uses a satisfaction measure: average overall satisfaction = (number of excellent reviews × 5) + (number of good reviews × 4) + (average number of reviews × 3) + (number of negative reviews) × 2 + (number of negative reviews × 1) indicates overall satisfaction/total number of reviews (1-5) indicates overall satisfaction with laboratory services. Percentage of excellent or good reviews: (number of excellent or good reviews for a specific laboratory service category × 100) / total number of reviews for a specific laboratory service category (1-5). Percentage of below-average or poor ratings: (Number of below-average or poor ratings for a given laboratory service category × 100) / Total number of ratings for a given laboratory service category (1-5) (16).

The average satisfaction score for each participant was calculated as the average of all satisfaction items. A binary logistic regression model was fitted to identify predictors of patient satisfaction with laboratory services. Significant variables with a p value of 0.20 in the univariate analysis were included in the multiple regression model. p-value is less than

Use 0.05 to determine statistical significance. Determine factors affecting patient satisfaction using adjusted odds ratios (AOR) with 95% confidence intervals (CI)(17).

Results

Demographic characteristics

Table (1) shows that all 414 sample respondents participated in the study, with a response rate of 97.8%. The majority of this study was 221 (53.4%) women, of which the age group 29-38 years included 182 (44.0%) and the married group included 224 (54.1%). The table also shows that most of the respondents have a college degree or above, accounting for about 170 (41.1%) of the respondents, while the largest number of

respondents are in the professional field, with 117 (28.3%) being government employees.

Patient satisfaction with clinical laboratory services Regarding patient satisfaction with clinical laboratory services, 245 (58.9%) respondents were satisfied, 134 (33%) were dissatisfied, and 35 (8.5%) were neutral or neutral about laboratory services. The score was 3.06 above the mean, with a St deviation of 1.05 (Figure 1).

Patient satisfaction with laboratory services

The cumulative value of patients' overall satisfaction with laboratory services is as follows: To determine the overall satisfaction of participants who came to the laboratory and participated in the study, those who were very satisfied and satisfied were considered satisfied, and those who were very dissatisfied and dissatisfied were considered is satisfied. Dissatisfiers and neutrals were excluded. As a result, the mean overall satisfaction using the Likert scale was 3.06. On another aspect of satisfaction with laboratory services, mean ratings ranged from 1.00 to 5.00.

Of the 21 measured variables, the majority of respondents were satisfied: laboratory location (69.5%), hygiene during blood collection (67.9%), measures taken to maintain confidentiality of laboratory staff (65.9%), maintenance Laboratory workflow procedures. Service confidentiality using screens to maintain patient safety (58.7%), number of seats in the health center (52.9%), distance from sample collection point to customer reception area (66%), service fees (76.3%), but many patients Being satisfied with the presence of laboratory staff during working hours (73.2%), we listed a total of twenty-one satisfaction indicators, and the average values of the services are as follows (Tables 2 and 3).

Factors related to patient satisfaction with

laboratory services

The analysis started with a bivariate logistic regression analysis, where explanatory variables with a p-value less than 0.2 were selected for the multiple logistic regression model to control for possible confounders. So; six variables; marital status, occupation as businessman and public sector employee, length of time to receive lab results, waiting time for ordering samples to arrive within 30 minutes, payment method for using services, attempt to collect blood sample using In bivariate logistic regression analysis, acupuncture and the availability of ordered testing at the health center were variables significantly associated with patient satisfaction (P value <0.2).

In the multiple logistic regression analysis, three variables; in the bivariate logistic regression analysis, payment method for receiving services, wait time to receive laboratory service results, and

availability and satisfaction with prescribed laboratory tests were statistically significant. Correlation. But in the multiple logistic regression analysis, there were three variables; time to receipt of lab results, availability of HC mandated lab testing (yes, there are some), and cost of lab services (yes) that were statistically significant relationship. Therefore, receipt of laboratory results occurred within one hour and within one hour; AOR = 2.5, 95% CI (1.04-6.2) and AOR = 3.4, 95% CI (1.2-9.3)

As well as the laboratory tests specified in this HC, yes they all have AOR=0.19, 95% CI (0.04-0.09), and yes there are some AOR=0.9, 95% CI (0.3-0.4) that are more likely Satisfy patients. While substituting reimbursement for laboratory services for coverage AOR = 0.45, a 95% CI (0.2-0.7) was found to make patients less likely to be satisfied (Table 5).

Table (1): Socio-demographic characteristics of patients attending laboratory services

Variable	Characteristics	Frequency	Percent
Sex	Male	204	46.9
	Female	216	57.4
Age	20-30	133	43.2
	31-40	177	37
	Above 41	88	32.1
Level of education	Primary	103	24.9
	Secondary	122	33.9
	Collage and above	165	41.7
Marital status	Single	119	29.3
	Married	203	54.4
	Divorced	39	9.6
	Widowed	33	6.5
Occupation	Un Employed	76	22
	Government employee	122	28.9
	Merchant	98	24.4
	Non- Government employee	101	23.2
	Others	17	3.3

Table (2): Patients ratings of satisfaction with different aspects of laboratory services received

Variables	Overall Satisfaction					Mean	S.D	Satisfaction percentage
	Very satisfied	satisfied	neutral	Dissatisfied	Very dissatisfied			
Pre laboratory service quality	13 (4.1%)	210 (50.7%)	74 (17.8%)	82 (22.2%)	25 (6%)	4.24	1.024	224 (54.4%)
The time it takes to get laboratory services	8 (2.2%)	247 (57.2%)	44 (20.4%)	76 (14.4%)	4 (1.8%)	4.48	0.476	246 (58.4%)
The queue to get the service	20 (4.4%)	227 (54.4%)	58 (14.4%)	72 (17.4%)	46 (4.7%)	4.4	1.045	247 (58.6%)
Respect and hospitality of the providers	50 (12.1%)	147 (44.1%)	40 (7.2%)	147 (45.5%)	50 (12.1%)	2.84	1.247	144 (45.2%)

Approach to keeping the service confidential? For example, private room space	17 (4.1%)	226 (54.6%)	2 (0.5%)	154 (47.2%)	15 (4.6%)	4.14	1.084	244 (54.7%)
Waiting timeto get a laboratory result	27 (6.5%)	144 (44.4%)	42 (10.1%)	122 (28.5%)	48 (8.4%)	4.08	1.171	211 (50.8%)
Location ofthe laboratory	44 (8.2%)	250 (60.4%)	24 (6.4%)	41 (18.6%)	17 (4.1%)	4.51	1.046	244 (68.5%)
Getting the ordered tests	47 (8.9%)	226 (54.6%)	31 (7.5%)	105 (25.4%)	15 (4.6%)	3.4	1.07	264 (64.5%)
Cleanliness and comfort of the laboratory	21 (7.6%)	168 (28.2%)	18 (4.2%)	176 (42.6%)	21 (7.6%)	2.86	1.186	188 (46.7%)
Number of seats in thehealth center	27 (6.6%)	182 (46.4%)	68 (14.2%)	106 (26.4%)	21 (7.6%)	2.18	1.116	218 (62.8%)
Cleanliness of blood samplesite	21 (7.6%)	260 (60.4%)	11 (2.7%)	101 (24.4%)	21 (6.1)	2.41	1.088	281 (67.8%)

Table (3): Patients ratings of satisfaction with different aspects of laboratory services received

Variables	Overall satisfaction							
	Very satisfied	satisfied	neutral	Dissatisfied	Very dissatisfied	Mean	S.D	Satisfaction percentage
Information giving by a service provider	18 (4.3%)	183 (44.3%)	55 (15.7%)	108 (35.1%)	40 (9.7%)	3.07	1.123	301 (48.5%)
Confidentiality of service provider	5 (1.4%)	357 (54.5%)	34 (5.8%)	103 (5.3%)	89 (1.9%)	3.37	0.953	373 (55.9%)
Communication skills of laboratory professional	31 (7.5%)	349 (50.1%)	34 (5.8%)	79 (19.1%)	31 (7.5%)	3.41	1.107	380 (57.5%)
Distance from the sample collection	35 (8.3%)	339 (57.7%)	13 (3.1%)	98 (33.7%)	39 (7%)	3.37	1.14	374 (55%)
Point to the customer reception area								
Quality ofthe service provider	42 (10.1%)	177 (40.2%)	28 (7.8%)	147 (25.2%)	21 (7.5%)	2.1	1.207	(50.4%)
Cost of laboratory services	20 (4.8%)	297 (71.5%)	21 (5.1%)	58 (14%)	19 (4.7%)	2.58	0.948	(77.2%)
Distance tothe toilet and theplace	28 (9.2%)	240 (58%)	49 (11.8%)	78 (18.8%)	9 (2.2%)	2.52	0.971	(77.2%)
Toilet cleanliness	54	121	24	129				

	(12%)	(21.7%)	(8.2%)	(22.7%)	57 (12.5%)	2.97	1.211	(44.7%)
Punctuality of service provider	15 (2.7%)	288 (79.7%)	22 (7.7%)	74 (17.9%)	5 (1.2%)	2.57	0.877	(72.2%)
In general, satisfaction level	15 (2.7%)	224 (54.1%)	41 (9.9%)	108 (27.1%)	27 (7.2%)	2.22	1.072	(57.7%)

Table (4): The overall patients' satisfaction level towards laboratory services multivariable logistic regression results of predictors of patient's satisfaction

Predictors	Response	Overall satisfaction		COR (95% CI)	AOR (95% CI)	P-Value
		Not satisfied	Satisfied			
Sex	Male	93	110	2.01 (0.6,1.5)	1.2 (0.7,2.1)	0.42
	Female	79	140	1	1	
Age	20-30	62	78	2.623 (0.6,3)	0.5 (0.03,7.3)	0.6
	30-40	80	202	2.297 (0.5,2.5)	0.8 (0.2,2.6)	0.7
	Above 41	30	62	1	2	
Occupation	Merchant	33	39	0.359 (0.2,0.8)	0.63 (0.2,2.3)	0.5
	Government employee	50	67	0.62 (0.35,2.2)	0.78 (0.2,2.8)	0.7
	NGO	33	59	0.727 (0.3,2.3)	0.69 (0.2,2.2)	0.5
	Other	3	20	2	2	
Marital status	Single	62	60	0.33 (0.2,2)	0.39 (0.2,2.7)	0.29
	Married	86	238	0.27 (0.09,0.8)	0.39 (0.2,2.8)	0.26
	Divorced	23	27	0.28 (0.08,0.9)	0.5 (0.2,2.3)	0.3
	Widowed	22	27	2	2	
Waiting time to get the result	2 -2 hour	59	58	2.8 (2.3,5.3)	2.5 (2.03,6.2)	.039*
	Less than 2 hr	202	253	3.2 (2.6,6.6)	3.3 (2.2,9.3)	.023*
	More than 2 hour	22	32	2	2	
Needle stick attempted to draw blood	One vein puncture	226	269	0.8 (0.3,2.9)	0.3 (0.03,2.8)	0.202
	Two vein puncture	32	59	0.9(0.3,2.3)	0.5(0.06,5.2)	203
	Three vein puncture	23	23	2	2	
Prescribed laboratory test available at	Yes, they are all	222	232	2.5 (2.02,6.2)	0.298 (0.03,0.09)	0.022*
	Yes, there are					

	some	58	62	2.9 (2.2,7.3)	0.9 (0.3,0.3)	0.039*
this health enter	Nothing	4	19	1	1	
The laboratory service paired	Yes	77	120	0.6 (0.4,0.9)	0.45 (0.2,0.7)	0.003*
	No	92	102	1	1	
The developed bruise after the Phlebotomy procedures	Yes	22	38	0.4 (0.28,0.78)	0.62 (0.3,1.2)	0.177
	No	149	184		1	

Discussion

Sociodemographic data and patient satisfaction levels

This study was conducted to assess patient satisfaction with laboratory services. In this study, the mean value was used as the cutoff value of 3.06, and 245 (58.9%) patients out of 414 participants were satisfied with clinical laboratory performance. This figure compares to studies conducted in Tehran 82%, Nepal 67%, South Korea 70.5%, India 73%, Iran 62.5%, Nigeria 68.1%, Ghana 61% and Addis Ababa ART clinics 85.5% Low. Differences may be due to differences in sample size, assessment tools used, and design. The Indian study, for example, used mixed methods.

Additionally, in terms of services provided by the laboratory, patients were satisfied with the cleanliness and convenience of the laboratory (67.8%), the extent to which necessary information was provided to laboratory staff (64.1%), and the cost of services (63.8%) Relatively satisfied.). . This may be because the institute's professional staff and senior managers receive similar training in laboratory services, but also because of social biases against respondents.

In our study, laboratory users were relatively dissatisfied with the absence of laboratory staff during working hours (50.1%). Patients were also very dissatisfied with toilet hygiene (43.4%), lack of privacy when collecting blood samples (48%) and laboratory uniforms of staff (56.3%), and insufficient information when collecting samples (57.2%). This may be due to a lack of focus on activities outside the laboratory space.

Factors related to satisfaction levels

According to the results of this study, the availability of requested laboratory tests during laboratory visits was found to be an important factor in satisfaction with laboratory services. This may be because patients who do not undergo requested laboratory testing at that time may be forced to seek laboratory services at private facilities at high cost.

In logistic regression, longer wait times to receive

laboratory results were associated with patient satisfaction. Longer waiting times reduce patient satisfaction with TAT

Compared with patients who waited 1-2 hours for lab results, waiting less than 1 hour was approximately three times more likely (AOR: 3.4; 95% CI; 1.2-9.3) and statistically significant Correlation (P value = 0.039). Patients are satisfied with clinical laboratory services. Patient satisfaction is higher when services are insured. Results showed that patients receiving services with insurance were 55% more satisfied than those without direct payment (AOR 0.45, 95% CI 0.2-0.7). Additionally, customers who waited less than an hour for the lab were three times more likely to have satisfactory results (AOR = 3.4; CI: 1.2-9.3) than those who waited more than two hours, and customers who received all requested lab results were three times more likely to complete testing than those who waited more than two hours. were 81% more likely (AOR=0.19; 95CI: 0.04-0.09) than those who did not use laboratory services (p value; 0.011).

Overall, some participants reported that the main problems in obtaining laboratory results were clean toilets, unavailability of health laboratory staff during working hours, and untimely information on service delivery. Some participants also pointed out that experts had problems with the use of medical terminology and expressed dissatisfaction with this. Respect from laboratory staff, adequate information about sample collection, adequate information about when and how to obtain laboratory results, and TAT of less than 30 minutes and 1 to 2 hours are predictors of patient satisfaction with clinical laboratory services

This result is lower than the results of studies conducted at Nekemte Referral Hospital (60.4%) (18), Tikur Anbesa Specialty Hospital (59.7%) (19), and Busan National University Hospital, Korea, 70.5% (20). This number is lower compared with reports from ART clinics in Addis Ababa (85.5%) (21) and three selected hospitals in eastern Ethiopia (87.6%) (22) and Iran (23) .

Furthermore, this finding is supported by multiple studies showing that laboratory patients are less satisfied with the cleanliness and accessibility of toilets (21), the convenient location of the laboratory, and the location of the laboratory (19). Furthermore, this finding is supported by a study conducted in Addis Ababa, a public hospital ART clinic (21) and Hawassa University (24), which showed that longer waiting times are associated with patients' Related to dissatisfaction.

Conclusion

In this study, respondents' age group, gender, marital status, education level, and occupation had no independent statistically significant association with patient satisfaction with laboratory services. However, patient satisfaction needs to be improved as nearly half of patients are dissatisfied with services. Health center managers should be aware of this and provide necessary support to health facilities and provide them with the necessary professionals and resources. Strategies should also be developed regarding the availability of mandatory laboratory testing. This service should be provided to laboratory specialists.

References

1. Vinagre M, Neves J. The Influence of Service Quality and Patients' Emotions on Satisfaction. *International Journal of Health Care Quality Assurance*; 2008; 21(1): 87-103.
2. Donabedian A. Methods for Deriving Criteria for Assessing the Quality of Medical Care. *MedCare Rev*; 1980; 37: 653-98.
3. World Health organization (WHO), Laboratory Quality Management System - Training toolkit, WHO/HSE/IHR/LYO/2009; World Health Organization, 2009.
4. Michalski CA, Diemert LM, Hurst M, Goel V, Rosella LC. Is life satisfaction associated with future mental health service use? An observational population-based cohort study. *BMJ Open*. 2022 Apr 29;12(4):e050057. doi: 10.1136/bmjopen-2021-050057. PMID: 35487704; PMCID:PMC9058709.
5. Hossen MP, Islam ANMS, Shohid S, Sen RR, Manzil MJ, Haque M, Dey C, Naznin MB, Begum D, Bhuiya MT and Farhana N (2023). Patients' satisfaction towards laboratory services at secondary level hospitals. *International Journal of Natural and Social Sciences*, 10(2): 37-46. DOI: 10.5281/zenodo.10575770
6. Geletta T, Eyasu E, Mikias D. Patients Satisfaction on Clinical Laboratory Services at Nekemte Referral Hospital, Oromia, Ethiopia. *Food Science and Quality Management*; 2014;30:25-30.
7. Oche, MO , Raji MO, Kaoje, AU, Gana G, Ango JT, Okafoagu N, Adamu H, et al, Clients' satisfaction with antiretroviral therapy services in a tertiary hospital in Sokoto, Nigeria, *J. AIDSHIV Res*; 2013: 5(9): 328-333.
8. Lim JS, et al. The role of hospital service quality in developing the satisfaction of the patients and hospital performance. *Manag Sci Lett*. 2018; 8:1353-1362.
9. Oostendorp RAB, et al. Relationships between context, process, and outcome indicators to assess quality of physiotherapy care in patients with Whiplash associated disorders: Applying Donabedian's model of care. *Patient Prefer Adherence*. 2020;14:425-442.
10. Zgierska A, et al. Impact of patient satisfaction ratings on physicians and clinical care. *Patient Prefer Adherence*. 2014; 8:437-446.
11. Alelign A, et al. Patient satisfaction with clinical laboratory services and associated factors among adult patients attending outpatient departments at Debre Markos referral hospital, Northwest Eth iopia. *BMC Res Notes*. 2019; 12:1-15.
12. Ejeta E, et al. Health care providers satisfaction with the clinical laboratory service of Nekemte referral hospital, Western Ethiopia. *"Int J Med*. 2015; 7:91-97.
13. Hailu HA, et al. Patients satisfaction with clinical laboratory services in public hospitals in Ethiopia. *PLoS One*. 2020; 9:1-9.
14. Bhatnagar H, et al. User experience and patient satisfaction with quality of tuberculosis care in India: A mixed methods literature review. *J Clin Tuberc Other Mycobact Dis*. 2019; 17:100127.
15. Ababa A, et al. Patient satisfaction with clinical laboratory services at Tik ur Anbessa Specialized Hospital. *PLoS One*. 2017; 1181-1188.
16. Petti CA, et al. Laboratory medicine in Africa: A barrier to effective health care . *Clin Infect Dis*. 2006; 42:377- 382.
17. Yao K, et al. Improving quality management systems of laboratories in developing countries: An innovative training approach to accelerate laboratory accreditation. *Am J Clin Pathol*. 2010;1 34:401-409.
18. Tadele G, Ejeta E, Desalegn M, et al. Clients satisfaction on clinical Laboratory Services at Nekemte Referral Hospital, Oromia, Ethiopia. *Food Sci Qual Manage*. 2014; 30.
19. Getachew R, Abota BA, Hailu M. Client satisfaction with clinical laboratory services at

- Tikur Anbessa Specialized Hospital, Addis Ababa, Ethiopia. Client Preference Adherence. 2017; 1:1181–8.
20. Koh YR, Kim SY, Kim I-S, et al. Customer Satisfaction Survey with Clinical Laboratory and Phlebotomy Services at a Tertiary Care Unit Level. *Ann Lab Med.* 2014; 34:380–5.
 21. Mindaye T, Taye B. Clients satisfaction with laboratory services at antiretroviral therapy clinics in public hospitals, Addis Ababa, Ethiopia. *BMC Res Notes.* 2012; 5:184.
 22. Teklemariam Z, Mekonnen A, Kedir H, et al. Clients and clinician satisfaction with laboratory services at selected government hospitals in eastern Ethiopia. *BMC Res Notes.* 2013; 6:15.
 23. Kashkoli SA, Zarei E, Daneshkohan A, Khodakarim S. Hospital responsiveness and its effect on overall patient satisfaction a cross-sectional study in Iran. *IJHCQA.* 2017; 30(8):728–36.
 24. Asefa A, Kassa A, Dessalegn M. Patient satisfaction with outpatient health services in Hawassa University teaching hospital Southern Ethiopia. *J Public Health Epidemiol.* 2014; 6(2):101–10.