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Factors Associated with Patient's Satisfaction with Medical Laboratory Services

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Abstract

Background: Laboratory services are a critical component of a high-quality healthcare system to detect diseases of public health significance. Patient satisfaction with laboratory services is essential for providing proper treatment. Patient satisfaction is vital and commonly used indicator for measuring and determines the level of laboratory service. Numerous studies in various countries which are conducted in hospitals have shown that patient's satisfaction with laboratory services was low. The study aims: To assess patients satisfaction with laboratory services and associated factors at a health center in Makkah, KSA. Methods: A descriptive cross sectional study was conducted from January to March 2022. Patients' satisfaction with laboratory services were assessed by using a previous similar study interviewer administered questionnaire. Statistical analysis was performed by using SPSS version soft 28 software. Bivariate and multivariate logistic regression was used to assess the relationship between dependent and independent variables. P value less than 0.05 was considered to be statistically significant association. Result: A total of 414 study participants were involved a systematic random sampling technique was used to select study participants in the study, 221 (53.4%) were female. About 37.4% of the respondents were found in the age range of 29-38 years. Majority, 245 (58.9%) of the study participants were found to be satisfied, 135 (32.6%) were dissatisfied whereas 35 (8.5%) were neutral towards clinical laboratory services provided. Conclusion: Patient satisfaction was good where almost six in every ten patients were satisfied with clinical laboratory services. Availability of all prescribed and gets the service without direct payment is increased patient satisfaction but waiting for a long time to get the service decreases the satisfaction of the patient.

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Introduction

Patient satisfaction is the perception of care received when compared to the care expected by patients. Evaluating to what extent patients are satisfied with health services is clinically relevant, as satisfied patients are more likely to comply with treatment, take an active role in their own care, continue using medical care services and stay within a health provider (where there are some choices) and maintain with a specific system (1, 2). Connection between health service of quality and naturally experiencing quality leads to customer satisfaction. The client satisfaction directly contributes to the experiencing quality and naturally experiencing quality also leads to client satisfaction (2).

Client satisfaction is the major component of quality management system, and is a significance source in the international organization for standardization (ISO). Ultimately, the laboratory procedures produce a product that is the test result for its customers. If the costumers are not well served, the laboratory is not achieving it's primarily function (3). Additionally, satisfaction is a psychological condition that arises from what is expected or not. Stimson and Webb have suggested that satisfaction is related to the perception of the outcome of care and the extent to which it meets patient expectations (4).

Patient satisfaction is a crucial and commonly used indicator for measuring the quality in any health care system (5). Patient satisfaction has a positive effect on clinical improvement, patient adherence and retention, job satisfaction, and appropriate clinical care by physicians (6). Measuring and improving customer satisfaction with laboratory services are essential aspects of laboratory medicine management (7). Patient satisfaction in laboratory services is measured by the quality and professionalism of the staff, adequate information to collect samples, time to receive laboratory results, availability of prescribed laboratory tests, laboratory room, laboratory room location, toilet availability and access (4, 6). Customer satisfaction the provider demonstrates the ability to successfully deliver care that meets the needs and wants of the customer (7).

Several factors affect customer satisfaction in consumer health care services, including customer socio-demographic characteristics, physical health status, customer perceptions, and expectations of a variety of health care services. The overall condition of the health center affect as well as the overall appearance of the premises affect the overall satisfaction of the client (8, 9). Measuring the satisfaction of laboratory service users is an indicator of the importance of the quality management system and is required for laboratory quality standards such as ISO 15189: 2012 and I SO17025: 2017, Studies show that satisfied clients receive treatment and counseling and are more likely to return to a health facility and, if necessary, pay for their services (8, 9).

Various studies have shown that the reasons for dissatisfaction with patients in all hospitals are the lack of infrastructure and certification systems. Low quality of laboratory services, inconvenience, and accessibility, lack of information. Toilet cleaning, long hours, wrong results, poor manpower management, poor resource supply, lack of commitment to leadership, weak communication system, and poor quality assurance management system. The lack of required laboratory services and the cost of services reasons for dissatisfaction (10, 11). One of the major problems facing our country today is the lack of quality health care and customer satisfaction, which are the top officials and staff in the health system (7, 10).

A satisfied patient recommends the services that express satisfaction to four or five people, and the satisfaction complains to twenty or more. Therefore, evaluating customer satisfaction with laboratory services is an important indicator to improve the quality of laboratory services. There is not enough literature in a series of a laboratory on the implementation of laboratory services in KSA. Therefore, this study aimed to assess patients' satisfaction with laboratory services and associated factors at a health center in Makkah, KSA.

Methods

A descriptive cross sectional study was conducted in public health centers at Makkah, KSA from January to March 2022. A total of 423 study participant were participated in our study valid response rate of 97.8% (12). The study was approved by the ethical committee of the University. All participants signed the informed consent before answered the questionnaire.

Data collection instrument: The structured questionnaire consisted of four parts: first part demographic questionnaire: included sex, age, educational status, occupational status, and marital status. Third part, service related factors; types of payment of services, How many times visit the health center, proximity to the health facility, waiting time to get the service, opening and closing hours of the service, needle stick attempted to draw blood, develop bruise, availability of prescribed test. Forth part, a facility related: Cleanness of waiting area, location of the laboratory, adequacy of sitting arrangement, cleanliness of the blood drawing area, accessibility of sample collector place, location and cleanness of latrine (13).

Statistical analysis: Data were entered and analyzed using SPSS version 28. Descriptive statistics were computed to describe the data. A 5 point Likert scale rating of very dissatisfied (1 point), dissatisfied (2 points), neutral (3 points), and satisfied (4 points), and very satisfied (5 point) was used (14). The use of the liker scale has endeavored in this study to measure the level of satisfaction among laboratory services clients to effectively manage its operation (15). The mean were interpreted as follow:

Value	Rating	Interpretation
5	4.21-5.00	Very satisfaction
4	3.41-4.20	Satisfaction
3	2.61-3.40	Neutral
2	1.81-2.60	Dissatisfaction
1	1.0-1.80	Very dissatisfaction

Satisfaction measures were used for each laboratory: Overall mean satisfaction score = (No. Of excellent rating × 5) + (No. of good rating × 4) + (No. of average ratings × 3) + (No. of below average ratings × 2) + (No. of poor ratings × 1) for overall satisfaction/total No. of rating (1- 5) for overall satisfaction with laboratory services. Percentage of excellent or good ratings: (No. of excellent or good ratings for specific laboratory service category × 100)/Total No. of ratings (1–5) for specific laboratory service category. Percentage of below average or poor ratings: (No. of below average or poor ratings for specific lab oratory service category × 100)/Total No. of Ratings (1 –5) for specific laboratory service category (16).

The mean score of satisfaction for each participant was calculated as the average of all satisfaction items. The binary logistic regression model was fitted to identify predictors of patients' satisfaction with laboratory services. Those variables significant at a p-value of 0.20 in the univariate analysis were included in multiple regression models. A p - value of less than 0.05 was used to determine statistical significance. Adjusted Odds Ratio (AOR) with 95% Confidence Interval (CI) was used to identify factors affecting patient's satisfaction level of

laboratory service (17).

Results

Demographic characteristics

Table (1) shows all 414 sampled respondents participated in the study making a 97.8% response rate. The majority in this study were 221 (53.4%) female, the age group between 29-38 which covers 182 (44.0%) and married group 224 (54.1%). Also, this table shows that the majority of respondents are from college and above, covering about 170 (41 .1%) of the participants, and most of the respondents in the field of occupation were 117 (28.3%) government employees.

Patient's satisfaction with clinical laboratory services

Regarding patients satisfaction with clinical laboratory services, 245 (58.9%) of respondents were satisfied 134 (33%) of respondents dissatisfied and 35 (8.5%) of respondents Neutral with the laboratory service or scored above the mean with score of 3.06, St. Deviation 1.05 (Figure 1).

Level of satisfaction of patients' towards laboratory services

The cumulative score for overall satisfaction of patients with laboratory services are as follows: To determine the overall satisfaction of the participants who came to the laboratory and participated in the study which are very satisfied and satisfied considered as satisfied and very dissatisfied and dissatisfied considers as dissatisfied and neutrals are excluding. As a result, the mean rate of overall satisfaction in the use of the Likert scale was 3.06. In a different aspect of laboratory service satisfaction, the mean rate range was 1.00 to 5.00.

Out of twenty one measuring variables, the majority of the respondents are satisfied: the location of laboratory (69.5%), hygiene during blood sampling (67.9%), measures taken to maintain the confidentiality of laboratory staff (65.9%), the approach to keeping the service confidentiality with using of the screen to keep the patient safety (58.7%), the number of seats in the health center (52.9%) The distance from the sample collection point to the customer reception area (66%), service charge (76.3%) and yet many patients due to the presence of laboratory staff during working hours (73.2%) Satisfied and we have listed a total of twenty one indicators of satisfaction the mean of the services shows below (Tables 2 and 3).

Factors associated with patient's satisfaction with laboratory services

The analysis began with bivariate logistic regression analysis in which explanatory variables with a p -value less than 0.2 were selected for multiple logistic regression models to control for possible confounding. Accordingly; six variables; marital status, occupation being merchant and government employed, time duration to get laboratory result, waiting time to give the sample ordered with in < 30 minute, payment type to get the service, Needle stick attempted to draw blood, and availability of test ordered in the health center were variables which had significant association with patients satisfaction in bivariate logistic regression analysis (P -value <0.2).

In multiple logistic regression analysis three variables; payment type to get the service, waiting time to get laboratory service result, and availability of prescribed laboratory tests had a statistically significant association satisfaction in bivariate logistic regression analysis. But on multivariate logistic regression analysis three variables; time duration to get laboratory result, availability of prescribed laboratory tests at HC (yes there are some) and payment for laboratory service (yes) had statistically significant association. Therefore, receiving laboratory result within one hour and 1- hour; AOR=2.5, 95% CI (1.04-6.2) and AOR=3.4, 95% CI (1.2-9.3)

and prescribed laboratory test available at this HC yes, they are all AOR=0.19, 95% CI (0.04 - 0.09) and Yes, there are some AOR=0.9, 95% CI (0.3 -0.4) were found to be more likely to satisfy patients. While pay for laboratory service rather than insured AOR=0.45, 95% CI (0.2-0.7) were found to be less likely to satisfy patients (Table 5).

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

Variable	Characteristics	Frequency	Percent
Sex	Male	193	46.6
	Female	221	53.4
Age	19-28	140	33.8
	29-38	182	44
	Above 39	92	22.2
Level of education	Primary	106	25.6
	Secondary	138	33.3
	Collage and above	170	41.1
Marital status	Single	121	29.2
	Married	224	54.1
	Divorced	41	9.9
	Widowed	28	6.8
Occupation	Un Employed	83	20
	Government employee	117	28.3
	Merchant	102	24.6
	Non- Government employee	98	23.7
	Others	14	3.4

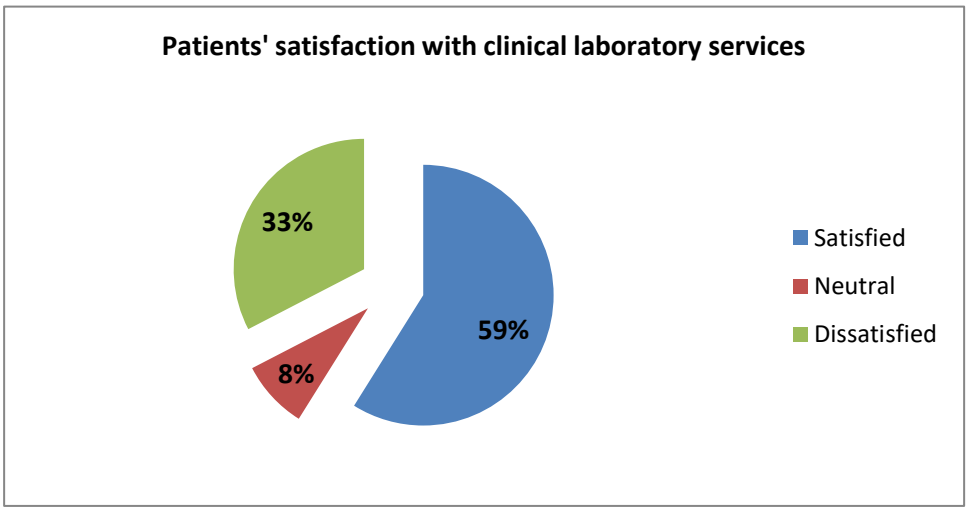

Table (2): Patients ratings of satisfaction with different aspects of laboratory services received

Variables	Overall Satisfaction							
	Very satisfied	satisfied	neutral	Dissatisfied	Very dissatisfied	Mean	S.D	Satisfaction percentage
Pre laboratory service quality	13 (3.1%)	210 (50.7%)	74 (17.9%)	92 (22.2%)	25 (6%)	3.23	1.024	223 (53.8%)
The time it takes to get laboratory services	9 (2.2%)	237 (57.2%)	84 (20.3%)	76 (18.4%)	8 (1.9%)	3.39	0.876	246 (59.4%)
The queue to get the service	20 (4.8%)	227 (54.8%)	59 (14.3%)	72 (17.4%)	36 (8.7%)	3.3.	1.085	247 (59.6%)
Respect and hospitality of the providers	50(12.1%)	137 (33.1%)	30 (7.2%)	147 (35.5%)	50 (12.1%)	2.98	1.287	188 (45.2%)
Approach to keeping the service confidential? For example, private room space	17 (4.1%)	226 (54.6%)	2 (0.5%)	154 (37.2%)	15 (3.6%)	3.18	1.094	243 (58.7%)
Waiting time to get a laboratory result	27 (6.5%)	184 (44.4%)	42 (10.1%)	122 (29.5%)	39 (9.4%)	3.09	1.171	211 (50.9%)
Location of the laboratory	38 (9.2%)	250 (60.3%)	28 (6.8%)	81 (19.6%)	17 (4.1%)	3.51	1.036	288 (69.5%)
Getting the ordered tests	37 (8.9%)	226 (54.6%)	31 (7.5%)	105 (25.4%)	15 (3.6%)	3.4	1.07	263 (63.5%)

Variables	Overall Satisfaction							
	Very satisfied	satisfied	neutral	Dissatisfied	Very dissatisfied	Mean	S.D	Satisfaction percentage
Cleanliness and comfort of the laboratory	31 (7.5%)	158 (38.2%)	18 (4.3%)	175 (42.5%)	31 (7.5%)	2.96	1.186	189 (45.7%)
Number of seats in the health center	27 (6.5%)	192 (46.4%)	59 (14.3%)	105 (25.4%)	31 (7.5%)	3.19	1.116	219 (52.9%)
Cleanliness of blood sample site	31 (7.5%)	250 (60.4%)	11 (2.7%)	101 (24.4%)	21 (5.1)	3.41	1.089	281 (67.9%)

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 (44.2%)	65 (15.7%)	108 (26.1%)	40 (9.7%)	3.07	1.123	201 (48.5%)
Confidentiality of service provider	6 (1.4%)	267 (64.5%)	24 (5.8%)	102 (6.3%)	89 (1.9%)	3.37	0.953	273 (65.9%)
Communication skills of laboratory professional	31 (7.5%)	249 (60.1%)	24 (5.8%)	79 (19.1%)	31 (7.5%)	3.41	1.107	280 (67.6%)
Distance from the sample collection	35 (8.3%)	239 (57.7%)	13 (3.1%)	98 (23.7%)	29 (7%)	3.37	1.14	274 (66%)

Variables	Overall satisfaction							
	Very satisfied	satisfied	neutral	Dissatisfied	Very dissatisfied	Mean	S.D	Satisfaction percentage
pointto the customer reception area								
Quality of the service provider	42 (10.1%)	167 (40.3%)	28 (6.8%)	146 (35.3%)	31 (7.5%)	3.1	1.206	209 (50.4%)
Cost of laboratory services	20 (4.8%)	296 (71.5%)	21 (5.1%)	58 (14%)	19 (4.6%)	3.58	0.948	316 (76.3%)
Distance to the toilet and the place	38 (9.2%)	240 (58%)	49 (11.8%)	78 (18.8%)	9 (2.2%)	3.53	0.971	278 (67.2%)
Toilet cleanliness	54 (13%)	131 (31.6%)	34 (8.2%)	139 (33.6%)	56 (13.5%)	2.97	1.311	185 (44.6%)
Punctuality of service provider	15 (3.6%)	288 (69.6%)	32 (7.7%)	74 (17.9%)	5 (1.2%)	3.57	0.866	303 (73.2%)
In general, satisfaction level	15 (3.6%)	224 (54.1%)	41 (9.9%)	108 (26.1%)	26 (6.3%)	3.23	1.072	239 (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	83	110	1.01 (0.6,1.5)	1.2 (0.6,2.1)	0.47
	Female	89	132	1	1	

Predictors	Response	Overall satisfaction		COR (95%CI)	AOR (95%CI)	P-Value
		Not satisfied	Satisfied			
Age	19-28	62	78	1.614 (0.6,4)	0.5 (0.03,7.3)	0.6
	29-38	80	102	1.197 (0.5,2.5)	0.8 (0.2,2.6)	0.7
	Above 39	30	62	1	1	
Occupation	Merchant	34	49	0.459 (0.2,0.8)	0.64 (0.1,2.3)	0.5
	Government employee	50	67	0.61 (0.35,1.1)	0.78 (0.2,2.8)	0.7
	NGO	43	59	0.717 (0.3,1.3)	0.69 (0.2,2.1)	0.5
	Other	4	10	1	1	
Marital status	Single	61	60	0.33 (0.1,1)	0.49 (0.1,1.7)	0.29
	Married	86	138	0.27 (0.09,0.8)	0.49 (0.1,1.8)	0.26
	Divorced	14	27	0.28 (0.08,0.9)	0.5 (0.1,2.3)	0.4
	Widowed	11	17	1	1	
Waiting time to get the result	1 -2 hour	59	58	2.8 (1.4,5.3)	2.5 (1.04,6.2)	.039*
	Less than 1 hr	101	153	3.2 (1.6,6.6)	3.4 (1.2,9.3)	.014*
	More than 2 hour	12	31	1	1	
Needle stick attempted to draw blood	One vein puncture	126	169	0.8 (0.4,1.9)	0.3 (0.03,2.8)	0.102
	Two vein puncture	32	59	0.9(0.3,2.4)	0.5(0.06,5.2)	203
	Three vein puncture	14	14	1	1	
Prescribed laboratory test available at	Yes, they are all	111	132	2.5 (1.01,6.1)	0.198 (0.04,0.09)	0.011*
	Yes, there are some	58	62	2.9 (1.1,7.4)	0.9 (0.3,0.4)	0.039*

Predictors	Response	Overall satisfaction		COR (95%CI)	AOR (95%CI)	P-Value
		Not satisfied	Satisfied			
this health enter	Nothing	3	18	1	1	
The laboratory service paired	Yes	80	120	0.6 (0.4,0.9)	0.45 (0.2,0.7)	0.003*
	No	92	122	1	1	
The developed bruise after the Phlebotomy procedures	Yes	22	48	0.4 (0.28,0.78)	0.62 (0.3,1.2)	0.188
	No	150	194		1	

Discussion

Socio demographic and level of patient satisfaction

This study was set out with the aim of assessing laboratory service satisfaction of patients towards laboratory services. In this study, using the mean score as cut off point 3.06 and 245 (58.9%) of patients among 414 participant were satisfied with clinical laboratory service. It was found lower compared to studies conducted in Tehran 82%, Nepal 67%, Korea 70.5%, India 73%, Iran 62.5%, Nigeria 68.1%, Ghana 61% and Addis Ababa ART clinic 85.5% . The discrepancy might be due to the difference in sample size, the assessment tools used, the design used for example in the Indian study mixed method was used.

In addition, the various services provided in the laboratory, patients were relatively satisfied with the cleanliness and convenience of the laboratory (67.8%), providing the necessary information to the laboratory staff (64.1%), and the cost of service (63.8%). This may be since professionals and senior management of the institute have received similar training on laboratory services, as well as societal bias against respondents.

In our study, laboratory service users were relatively dissatisfied with the absence of laboratory staff during working hours (50.1%), Similarly, patients were very dissatisfied with toilet hygiene (43.4%), lack of privacy during blood sampling (48%), laboratory workers professional dressing (56.3%), and inadequate information during sampling (57.2%). These may be due to a lack of attention to activities outside the laboratory room.

Factor association with the level of satisfaction

Based on the results of this study, it was found that the availability of the requested laboratory tests during their visit in the laboratory has a significant factor towards laboratory service satisfaction. It may be due to the patients who fail to get the requested laboratory tests at the time could have been forced to get the laboratory service at the private facility with high costs.

In logistic regression long wait hour to get a laboratory result has association with patient satisfaction, increase waiting time decrease their patient satisfaction level towards TAT

between less than one hours was about 3 times more likely than those (AOR: 3.4; 95% C.I; 1.2-9.3) when compared to those patients awaiting their laboratory results 1-2 hours which had statistically significant association (P value=0.039) with patient satisfied towards clinical laboratory services. Patient satisfaction is higher if the service is insured, the finding shows that the patients who are insured to get the service are 55% more likely to be satisfied (AOR 0.45, 95% CI 0.2-0.7) than those patients who without direct payment by laboratory service, Moreover those clients who waited less than one hours to get laboratory results were 3 times more likely to be satisfied (AOR =3.4; CI: 1.2–9.3) than those who waited more than two hours and clients who got all requested laboratory tests were 81% more likely to be satisfied (AOR=0.19; 95CI: 0.04–0.09) than those who did not got laboratory services (p -value; 0.011).

In general, some of the participants commented that the main problems in the process of receiving laboratory results, the cleanliness of the toilets, the absence of health laboratory workers during work hours, and the lack of timely information on service delivery were the main problems. Some participants also commented that there was a problem with the experts' use of medical terms and that they were not satisfied. Respect from the laboratory personnel, adequate information to collect specimen, adequate information when and how to receive laboratory results as well as TAT less than 30 minutes and between 1 and 2 hours were the predictors for patients` satisfaction towards clinical laboratory services

This finding was lower than findings of studies conducted in Nekemte Referral Hospital (60.4%) (18), Tikur Anbesa Specialized Hospital (59.7%) (19), and Pusan National University Hospital, Korea, 70.5% (20) and lower as compared with the reports from ART clinics in Addis Ababa (85.5%) (21) and three selected hospitals in Eastern Ethiopia (87.6%) (22) and Iran (23).

Moreover, this finding was supported by various studies that showed laboratory patients had low satisfaction level with latrine cleanness and accessibility (21), the convenient location of the laboratory, and the location of the laboratory (19). Furthermore, this finding is supported with a study conducted in Addis Ababa, public hospital ART clinics (21), and Hawassa University (24), that showed long waiting hours were associated with dissatisfaction of patients.

Conclusion

In this study Age group, sex, marital status, educational level and occupation of the respondents did not have any independent statistically significant association with the satisfaction of patients towards laboratory services. Still patient satisfaction needs improvement because close to half of the patients are not satisfied with services. Managers of health center should be aware of this and provide the essential support to the health facilities and provide them with the necessary professional and resources. Also, should develop strategies to available prescribed laboratory tests. The laboratory professionals should be given the service at a time.

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. Med Care 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. AIDS HIV 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 servi ce 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 accreditatio n. 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.