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THE EFFECT OF LABORATORY SERVICE QUALITY ON PATIENT SATISFACTION AT PUSKESMAS AJUNG, JEMBER REGENCY

Ahmad Hotip Ragil Liansyah[1)], Indria Yuli Susanti[2)], Harmawan Teguh Saputra[3)]

[1,2,3)] Faculty of Economics, Universitas PGRI Argopuro Jember, Indonesia
[1,2,3)]mfaadah@gmail.com(*), indria1107@gmail.com, wa0n3.saputra@gmail.com

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*Correspondence:
Name: Ahmad Hotip Ragil Liansyah
E-mail: mfaadah@gmail.com

Editorial Office
Ambon State Polytechnic
Center for Research and Community Service
Ir. M. Putuhena Street, Wailela-Rumahtiga, Ambon
Maluku, Indonesia
Postal Code: 97234

ABSTRACT

Introduction: *Laboratory services are an essential component of primary healthcare as they support accurate diagnosis and treatment, while also influencing patient perceptions of service quality. However, issues such as long waiting times, limited facilities, and unclear communication may reduce patient satisfaction. Therefore, this study aims to examine the effect of laboratory service quality on patient satisfaction at Puskesmas Ajung, Jember Regency.*
Methods: *This research employed a quantitative approach with a cross-sectional design using accidental sampling, involving 36 respondents who received laboratory services. Data were collected through a structured questionnaire based on service quality dimensions, including reliability, responsiveness, assurance, empathy, and tangibles, and were analyzed using validity and reliability tests and simple linear regression analysis.*
Results: *The findings indicate that laboratory service quality has a positive and significant effect on patient satisfaction, as evidenced by a regression coefficient of 0.257 and a significance value of 0.000, which is lower than 0.05. The correlation coefficient shows a moderately strong relationship, while the coefficient of determination indicates that 31.1% of patient satisfaction can be explained by laboratory service quality.*
Conclusion and suggestion: *It can be concluded that improving laboratory service quality, particularly in terms of service speed, clarity of information, staff professionalism, and facility comfort, will enhance patient satisfaction. Therefore, healthcare providers are encouraged to continuously improve service quality and facilities, while future researchers are advised to include additional variables and larger sample sizes to obtain more comprehensive results.*

INTRODUCTION

Primary health care constitutes the fundamental foundation of the national health system. In Indonesia, Community Health Centers (*Pusat Kesehatan Masyarakat* or Puskesmas) play a strategic role as first-level health care facilities responsible for providing accessible, timely, and comprehensive health services to communities at the sub-district level. The role of Puskesmas is not limited to curative services but also encompasses promotive, preventive, and rehabilitative efforts. Along with the increasing public demand for high-quality health services, improving service quality at Puskesmas has become a crucial aspect that requires serious attention (Pradnyani *et al.*, 2024).

One of the important indicators of service quality at Puskesmas is the quality of laboratory services. The laboratory unit plays a vital role in providing rapid, accurate, and reliable diagnostic support for medical personnel.

Laboratory services serve as a fundamental basis for establishing diagnoses of various diseases, including infectious diseases and non-communicable diseases such as diabetes mellitus, hypertension, anemia, as well as supporting examinations in antenatal care services (Hernaningsih and Aulia, 2023). The quality of laboratory services greatly determines the success of early detection, diagnostic accuracy, and the effectiveness of disease management (Lestari and Mulyawati, 2025). Therefore, laboratory service quality must reflect service speed, accuracy of examination results, facility comfort, staff professionalism, and service consistency.

Previous studies indicate that the quality of laboratory services has a significant influence on patients' perceptions of overall health service quality (Putri, Guspianto and Hubaybah, 2022). Based on the SERVQUAL model, service quality is measured through five dimensions: reliability, responsiveness, assurance, empathy, and tangibles (Marzuq and Andriani, 2022). Inaccurate test results, long waiting times, uncommunicative staff attitudes, and uncomfortable facility conditions can reduce perceived service quality and directly affect patient satisfaction levels (Rosida, 2024). Conversely, laboratory services that are fast, friendly, safe, and professional have been proven to increase patient trust and loyalty toward Puskesmas (Suhendar *et al.*, 2024).

Several studies conducted in Indonesia further emphasize the importance of laboratory service quality as a determinant of patient satisfaction. Ginting et al. (2024) found that patient complaints regarding laboratory services at Puskesmas were largely related to long waiting times and a lack of clarity in communicating examination results. Research by Fajriah (2025) revealed that staff competence, completeness of equipment, and comfort of examination rooms play significant roles in shaping patient satisfaction. Meanwhile, Purba *et al.* (2024) emphasized that staff communication, service attitude, and accuracy of examination results contribute significantly to patient satisfaction assessments.

In Jember Regency, Puskesmas serve as primary health care facilities heavily relied upon by communities across 31 sub-districts. According to the Jember Regency Health Office report (2023), patient visit numbers have shown an increasing trend each year, including visits for laboratory services. This growing patient volume demands laboratory services that are not only fast and accurate but also capable of providing comfort, assurance, and effective communication to patients. However, monitoring results indicate that laboratory service quality in several Puskesmas still faces various challenges.

Common problems include relatively long service waiting times, particularly during peak hours, suboptimal staff communication, and waiting room facilities that do not fully support patient comfort. In addition, the high workload of laboratory personnel and the practice of holding multiple roles in other units also affect the smoothness and consistency of service workflows. These conditions potentially lead to delays in test results and decreased patient satisfaction.

Similar conditions are also found at Puskesmas Ajung, one of the Puskesmas with a relatively high patient visit rate. With an average of more than three thousand visits per month, approximately nine hundred of these patients require laboratory services. This high volume places considerable pressure on the laboratory service system. Internal monitoring results indicate that waiting times on certain days can reach nearly one hour. Moreover, the laboratory waiting area is considered uncomfortable due to limited space and inadequate air circulation. Complaints have also emerged regarding delays in the delivery of examination results, particularly for tests requiring longer processing times.

Preliminary interviews with several patients revealed that although laboratory staff were friendly, information regarding examination procedures and estimated result completion times was not clearly communicated. This situation caused confusion and uncertainty among patients. Additionally, discomfort in the waiting area and prolonged service times affected patients' overall service experience. These findings indicate that the quality of laboratory services at Puskesmas Ajung still requires improvement, particularly in terms of service speed, clarity of information, facility comfort, and staff responsiveness.

In the context of health care services, patient satisfaction is an important indicator for evaluating service quality. Discomfort during waiting periods, delays in examination results, and minimal communication from staff are factors that can reduce patient satisfaction levels. Numerous studies have confirmed that high-quality laboratory services, viewed through the dimensions of reliability, responsiveness, assurance, empathy, and tangibles, have a significant influence on patient satisfaction (Purwitasari, Suryawati and Purnami, 2023).

Laboratory service quality also plays a crucial role in building public trust in Puskesmas as primary health care facilities. Professional, comfortable, and informative services encourage patients to continue utilizing Puskesmas services. Conversely, services perceived as slow and lacking certainty may prompt patients to seek care at alternative health facilities. Therefore, improving laboratory service quality is a strategic aspect in maintaining the sustainability and quality of primary health care services.

Based on the above discussion, a study examining the effect of laboratory service quality on patient satisfaction at Puskesmas Ajung is essential. This study is expected to provide empirical evidence regarding the extent to which laboratory service quality influences patient satisfaction and to serve as a basis for recommendations to Puskesmas management in improving laboratory service quality on a sustainable basis.

LITERATURE REVIEW

1. Service Quality

Service quality is a crucial concept in the health care sector as it determines the level of public acceptance and perception of the quality of services provided. According to Parasuraman, Zeithaml and Berry (1988) service quality refers to the degree of conformity between the service expected and the service perceived by customers. In line with this view, Susanti *et al.* (2021) defines service quality as the gap between customers' expectations and the actual service they receive.

In the context of health care services, service quality reflects the ability of medical personnel and health care facilities to meet patients' needs in a professional, responsive, and humane manner. Service quality serves as an important performance indicator in primary health care facilities such as Puskesmas, as it is directly related to patient trust and satisfaction. When services are not delivered in accordance with established standards, a gap emerges between expectations and reality, which may reduce perceived service quality.

2. SERVQUAL Model

The SERVQUAL model is one of the most widely used frameworks in service quality research, particularly in the health care sector. This model measures service quality through five main dimensions (Manurung, 2022):

a. Reliability, the ability of service providers to deliver accurate, consistent, timely, and procedure-compliant services.
b. Responsiveness, the willingness and ability of staff to assist patients promptly, provide clear information, and respond to complaints or inquiries.
c. Assurance, the competence of staff, professional attitudes, courtesy, and the ability to convey a sense of security and trust to patients.
d. Empathy, the provision of individualized attention, friendly attitudes, effective communication, and an understanding of patients' needs.
e. Tangibles, the physical appearance of facilities, including waiting rooms, laboratory cleanliness, examination equipment, and staff neatness.

These five dimensions serve as the primary framework for assessing laboratory service quality at Puskesmas Ajung.

3. Quality of Health Laboratory Services

In the context of primary health care services such as Puskesmas, laboratory services play a vital role as they contribute to diagnostic accuracy and clinical decision-making, while also shaping public trust in the health care system. Sepriano, Suharyanto and Judijanto (2025) state that high-quality laboratory services support accurate diagnoses and timely treatment and enhance public confidence in health care facilities. Furthermore, laboratory service quality has a substantial impact on patient satisfaction. Sosmira, Harahap and Suroyo (2021) found that waiting time, staff attitudes, and laboratory personnel skills are directly associated with patient satisfaction levels.

4. Patient Satisfaction

Patient satisfaction refers to the level of patients' feelings after comparing the services they receive with their initial expectations. Satisfaction reflects service quality from the patient's perspective, as it indicates the extent to which health services meet patients' needs and expectations (Sitepu and Kosasih, 2024). In the health care context, patient satisfaction is influenced by various factors, including service speed, staff friendliness, facility comfort, accuracy of examination results, and the overall patient experience throughout the service process (Doni and Andi, 2025).

Several factors are known to influence patient satisfaction levels (Klawdina, 2021) , including:

a. Service waiting time;
b. Availability of facilities and medical equipment;

c. Quality of interaction between laboratory staff and patients;
d. Accuracy of examination results;
e. Smoothness of laboratory service processes.

In the context of laboratory services at Puskesmas in Jember, patients generally seek rapid examinations such as hemoglobin tests, blood glucose tests, or complete urinalysis. In such situations, laboratory service quality plays a critical role in shaping patient experiences, particularly in terms of service timeliness, accuracy of test results, and workflow efficiency. When laboratory service quality is suboptimal such as delayed services, unresponsive staff, or inefficient examination processes patients may experience longer waiting times and discomfort during the service process. These conditions influence patients' perceptions of service quality and directly affect their satisfaction levels. Conversely, fast, accurate, friendly services supported by adequate facilities enhance patient satisfaction and trust in laboratory services at Puskesmas.

Patient dissatisfaction can lead to several negative implications (Prasetiyo *et al.*, 2025), including:

a. Decreased patient loyalty;
b. Increased numbers of complaints;
c. Negative impacts on the reputation of health care facilities;
d. Reduced public trust in Puskesmas services.

Therefore, improving laboratory service quality is a strategic effort to enhance patient satisfaction. Timely, accurate, responsive, and friendly services, supported by adequate facilities, foster positive patient perceptions of laboratory services and directly contribute to higher patient satisfaction levels.

6. Effect of Service Quality on Patient Satisfaction

Numerous studies indicate that service quality is a significant factor influencing patient satisfaction. The dimensions of reliability, responsiveness, assurance, empathy, and tangibles have been shown to have positive relationships with patient satisfaction across various health care settings (Marzuq and Andriani, 2022). High-quality laboratory services create positive patient experiences, increase trust, facilitate treatment processes, and strengthen patient loyalty to health care facilities (Nurfitriani *et al.*, 2024). Conversely, poor service quality leads to complaints, discomfort, and the potential migration of patients to alternative facilities, such as private laboratories. In the context of Puskesmas Ajung, suboptimal laboratory service quality such as prolonged waiting times, delays in test results, and limited facility comfort can reduce patient satisfaction. Therefore, it is essential to empirically examine the effect of service quality on patient satisfaction.

RESEARCH METHODS

This study employed a quantitative approach with an associative research design, aimed at analyzing the effect of laboratory service quality on patient satisfaction at Puskesmas Ajung. The study was conducted at Puskesmas Ajung, Jember Regency, with the population consisting of all patients receiving laboratory services. The research sample was determined using accidental sampling, involving patients who visited and were willing to participate as respondents during the study, with the sample size adjusted according to the requirements of statistical analysis.

Data were collected using a structured questionnaire developed based on the SERVQUAL service quality dimensions, including reliability, responsiveness, assurance, empathy, and tangibles, as well as the patient satisfaction variable. The research instrument was tested for validity and reliability prior to use to ensure the appropriateness of the measurements. The collected data were subsequently analyzed using descriptive and inferential statistical analyses to assess the condition of laboratory service quality and its effect on patient satisfaction.

Data analysis was performed with the assistance of statistical software through regression testing to determine the influence of laboratory service quality on patient satisfaction. The results of the analysis were used to draw conclusions regarding the significance and strength of the relationship between the variables, as well as to provide recommendations for improving the quality of laboratory services at Puskesmas Ajung.

RESULT AND ANALYSIS

1. Instrument Testing

The initial and crucial step in data analysis in this study was conducting instrument quality testing. This testing aimed to ensure that the data collected through the questionnaire were appropriate, valid, and reliable before being further processed in hypothesis testing. A research instrument must be able to measure variables accurately according to the predetermined concepts so that the resulting analysis has scientific validity. Therefore, instrument quality testing in this study consisted of two main stages: validity testing and reliability testing. Validity testing

was conducted to examine the suitability of each statement item with the construct being measured, while reliability testing was used to ensure the consistency of respondents' answers to the instrument.

a. Validity

Validity testing in this study was carried out to determine whether each statement item in the questionnaire was able to measure the intended variable appropriately. The analysis technique used was Pearson Product Moment correlation, in which the calculated correlation coefficient (r count) of each item was compared with the r table value at a 5% significance level.

The number of respondents in this study was 36. This sample size was considered adequate because it met the minimum requirements for quantitative statistical analysis, particularly correlation and regression testing, which generally require a sample size greater than 30 to ensure data normality and statistical stability. In addition, the sample was determined based on the availability of respondents who met the research criteria using accidental sampling at Puskesmas Ajung, making it representative of the population under study.

Based on the number of respondents (n = 36), the degree of freedom (df) was calculated using the formula n − 2, resulting in df = 34. Based on this calculation, the r table value at α = 0.05 and df = 34 was 0.329. A statement item is considered valid if the r count value is greater than the r table value, whereas items with r count values lower than the r table value are considered invalid.

Table 1. Results of the Validity Test for Laboratory Service Quality (X) and Patient Satisfaction (Y)

No.	Item Code	r-value (Item–Total Correlation)	r-table (df = 34, α = 0.05)	Remarks
1	X1	0.581	0.329	Valid
2	X2	0.426	0.329	Valid
3	X3	0.386	0.329	Valid
4	X4	0.484	0.329	Valid
5	X5	0.584	0.329	Valid
6	X6	0.391	0.329	Valid
7	X7	0.401	0.329	Valid
8	X8	0.361	0.329	Valid
9	X9	0.348	0.329	Valid
10	X10	0.411	0.329	Valid
11	X11	0.694	0.329	Valid
12	X12	0.750	0.329	Valid
13	X13	0.597	0.329	Valid
14	X14	0.701	0.329	Valid
15	X15	0.559	0.329	Valid
16	Y1	0.829	0.329	Valid
17	Y2	0.465	0.329	Valid
18	Y3	0.489	0.329	Valid
19	Y4	0.483	0.329	Valid
20	Y5	0.463	0.329	Valid
21	Y6	0.545	0.329	Valid
22	Y7	0.513	0.329	Valid
23	Y8	0.516	0.329	Valid
24	Y9	0.494	0.329	Valid
25	Y10	0.492	0.329	Valid

Based on the results of the validity testing presented in the table, all statement items in the Laboratory Service Quality variable (X), consisting of 15 items (X1–X15), and the Patient Satisfaction variable (Y), consisting of 10 items (Y1–Y10), show that the calculated r values for each item are greater than the r table value of 0.329. This indicates that all statement items meet the construct validity criteria. Therefore, it can be concluded that all research instruments are valid and feasible to be used as data collection tools in this study.

b. Reliability

Reliability testing was conducted to determine the extent to which the research instrument is able to produce consistent and stable results when used repeatedly under relatively similar conditions. A reliable instrument indicates that each statement item in the questionnaire has good internal consistency in measuring the intended construct. In this study, reliability testing was carried out using the **Cronbach's Alpha** method,

as this technique is one of the most commonly used approaches to assess the reliability level of instruments developed using a Likert scale.

Table 2. Reliability Levels

Alpha Value	Reliability Level
≥ 0.90	Very high / highly reliable
0.80 – 0.89	High
0.70 – 0.79	Moderate
0.60 – 0.69	Low
< 0.60	Not reliable

Table 3. Reliability Test Results

Reliability Statistics	
Cronbach's Alpha	N of Items
.833	25

Based on the results of the reliability analysis, a Cronbach's Alpha value of 0.833 was obtained with a total of 25 items. When compared with the reliability criteria, this value falls within the range of 0.80–0.89, which is categorized as high reliability. Therefore, it can be concluded that the research instrument has good internal consistency and is reliable and appropriate for use as a data collection tool in this study.

2. Descriptive Analysis

As a complement to the validity and reliability testing, this study also conducted descriptive statistical analysis on each statement item of the laboratory service quality variable (X) and the patient satisfaction variable (Y). The descriptive analysis includes minimum and maximum values, total scores, mean values, and standard deviations for each item, based on responses from 36 respondents. This analysis aims to identify the tendency of respondents' answers to each item and to describe the distribution of the data obtained from the questionnaire responses.

Table 4. Descriptive Statistics Test

Descriptive Statistics								
Var	N	Range	Min	Max	Sum	Mean	Std. Deviation	Variance
X1	36	1	4	5	163	4.53	.506	.256
X2	36	2	3	5	164	4.56	.607	.368
X3	36	3	2	5	166	4.61	.803	.644
X4	36	1	4	5	166	4.61	.494	.244
X5	36	4	1	5	154	4.28	1.111	1.235
X6	36	2	3	5	164	4.56	.773	.597
X7	36	3	2	5	154	4.28	.882	.778
X8	36	4	1	5	159	4.42	1.105	1.221
X9	36	2	3	5	161	4.47	.609	.371
X10	36	4	1	5	155	4.31	1.117	1.247
X11	36	3	2	5	146	4.06	.924	.854
X12	36	3	2	5	150	4.17	.845	.714
X13	36	4	1	5	144	4.00	1.069	1.143
X14	36	3	2	5	151	4.19	.822	.675
X15	36	3	2	5	149	4.14	.931	.866
Y1	36	1	4	5	163	4.53	.506	.256
Y2	36	3	2	5	160	4.44	.695	.483
Y3	36	1	4	5	165	4.58	.500	.250
Y4	36	1	4	5	166	4.61	.494	.244
Y5	36	1	4	5	166	4.61	.494	.244
Y6	36	3	2	5	161	4.47	.810	.656
Y7	36	1	4	5	168	4.67	.478	.229
Y8	36	2	3	5	163	4.53	.609	.371
Y9	36	2	3	5	162	4.50	.609	.371
Y10	36	1	4	5	169	4.69	.467	.218

Based on the descriptive statistical output, all items in variables X and Y show mean values above 4. For example, item X1 has a mean of 4.53, X4 of 4.61, X8 of 4.42, while items Y7 and Y10 have mean values of 4.67 and 4.69, respectively. These high mean scores indicate that most respondents selected responses in the "agree" to "strongly agree" categories. Thus, it can be interpreted that respondents' perceptions of laboratory service quality and patient satisfaction are at a very good level. The distribution of data across all items also appears stable, as reflected by standard deviation values ranging from approximately 0.47 to 1.11. Several items exhibit relatively low standard deviations, such as X1 (0.506) and Y10 (0.467), indicating homogeneous responses, while others, such as X5 (1.111) and X10 (1.117), show slightly greater variability but remain within acceptable limits and do not suggest extreme deviations. Overall, these standard deviation values demonstrate that respondents' answers are consistent and well controlled. These descriptive findings indicate that the majority of respondents provided positive evaluations of laboratory service quality and that patient satisfaction is categorized as very high, as evidenced by the high mean scores and relatively stable data distribution. Consequently, the descriptive analysis supports the conclusion that the instrument accurately represents respondents' perceptions and is suitable for subsequent stages of data analysis.

3. Classical Assumption Test

a. Normality Test

The classical assumption test is an essential stage in regression analysis, as the adequacy of a statistical model largely depends on the fulfillment of its underlying assumptions. One of the key assumptions that must be satisfied is the normality of the residuals, which aims to ensure that the prediction errors in the regression model are normally distributed and do not exhibit a specific pattern. In the study examining the effect of laboratory service quality on patient satisfaction at Puskesmas Ajung, Jember Regency, the normality test is particularly relevant because assessments of service quality are subjective and may involve variations in respondents' perceptions. Therefore, prior to hypothesis testing, it is necessary to confirm that the residuals of the regression model follow a normal distribution.

Table 5. Normality Test

One-Sample Kolmogorov-Smirnov Test		
		Unstandardized Residual
N		36
Normal Parameters[a,b]	Mean	.0000000
	Std. Deviation	2.47973478
Most Extreme Differences	Absolute	.133
	Positive	.082
	Negative	-.133
Test Statistic		.133
Asymp. Sig. (2-tailed)		.109[c]

Normality testing was conducted using the One-Sample Kolmogorov–Smirnov Test on the unstandardized residuals. Based on the test results, the Asymp. Sig. (2-tailed) value was 0.109 with a total of 36 respondents. Since this significance value is greater than the 0.05 significance level, it can be concluded that the residuals of the regression model are normally distributed. Therefore, the normality assumption of the regression model has been fulfilled, and the model is considered appropriate to proceed to the next stage of analysis.

The fulfillment of the normality assumption indicates that patients' perceptions of laboratory service quality and their level of satisfaction do not show extreme deviations and are not influenced by significant outliers. This suggests that respondents' response patterns are relatively homogeneous and consistent, both in assessing laboratory service aspects and in expressing their satisfaction levels. Moreover, good residual normality strengthens the confidence that the relationship between laboratory service quality and patient satisfaction obtained through regression analysis reflects actual empirical conditions in the field rather than being the result of data distortion. Thus, the regression analysis results in this study have strong statistical validity and can serve as a reliable basis for drawing conclusions and formulating recommendations to improve laboratory service quality at Puskesmas Ajung, Jember Regency.

b. Multicollinearity Test

The multicollinearity test was conducted to determine whether there is a high correlation among independent variables in the regression model that could interfere with the stability of the model estimates. A

good regression model should not exhibit multicollinearity, which is indicated by Tolerance values greater than 0.10 and Variance Inflation Factor (VIF) values less than 10.

Table 6. Multicollinearity Test

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Tolerance	VIF
1	(Constant)	28.909	4.292		6.735	.000		
	Lab Quality	.257	.066	.558	3.916	.000	1.000	1.000

a. Dependent Variable: Patient Satisfaction

Based on the SPSS output in the *Coefficients* table, the Service Quality variable has a Tolerance value of 1.000 and a VIF value of 1.000. Both values are well above the minimum threshold for Tolerance and far below the critical limit for VIF, indicating that the regression model does not experience multicollinearity problems. In other words, the service quality variable does not have a high linear correlation with other variables in the model, so the regression model can be considered stable and suitable for further analysis. Furthermore, the regression analysis shows that laboratory service quality has a significant effect on patient satisfaction. This is evidenced by a regression coefficient of 0.257 and a t-value of 3.916. With a sample size of 36 and one independent variable, the degrees of freedom (df) are 34. At a 5% significance level using a one-tailed test ($\alpha = 0.05$), the critical t-value is 1.691. Since the calculated t-value (3.916) is greater than the critical t-value (1.691) and the significance value is $0.000 < 0.05$, laboratory service quality is proven to have a significant effect on patient satisfaction. Thus, the research hypothesis is accepted, indicating that better laboratory service quality leads to higher levels of patient satisfaction at Puskesmas Ajung, Jember Regency.

c. Heteroskedasticity Test

In the study analyzing the effect of laboratory service quality on patient satisfaction at Puskesmas Ajung, Jember Regency, a heteroskedasticity test was conducted to ensure that the regression model satisfies the homoscedasticity assumption, namely that the variance of the residuals remains constant across all levels of the predicted values. This assumption is important because inconsistent residual variance can lead to biased estimation results and reduce the reliability of the model in explaining the relationship between laboratory service quality and patient satisfaction. Based on the scatterplot of the Regression Standardized Predicted Values and the Regression Studentized Residuals, the data points are randomly dispersed above and below the zero line and do not form any specific pattern. There is no indication of clustering, narrowing, widening, or funnel-shaped patterns in the plot. This random distribution suggests that the residual variance is relatively constant across the range of predicted values.

Therefore, it can be concluded that the regression model does not suffer from heteroskedasticity, and the homoscedasticity assumption is fulfilled. This condition indicates that the regression model is appropriate for examining the effect of laboratory service quality on patient satisfaction, and the analysis results can be interpreted more accurately because they are not affected by irregular error variance.

4. Simple Regression Test

a. Regression Equation Model

The simple linear regression analysis was conducted to determine the extent to which laboratory service quality influences patient satisfaction at Puskesmas Ajung, Jember Regency. This analysis aims to examine both the direction of the relationship between the two variables and the magnitude of the contribution of changes in service quality to changes in patient satisfaction.

Table 7. Regression Equation Model

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	28.909	4.292		6.735	.000
	Lab Quality	.257	.066	.558	3.916	.000

a. Dependent Variable: Patient Satisfaction

Based on the SPSS output in the Coefficients table, the regression equation is as follows:

$$Y = 28{,}909\ (\alpha) + 0{,}257\ (X) + e$$

The constant value of 28.909 indicates that if the quality of laboratory services remains at zero or does not improve, the baseline level of patient satisfaction is still 28.909. This suggests that there are other factors beyond laboratory service quality that also contribute to patient satisfaction.

Furthermore, the regression coefficient for the laboratory service quality variable (X) of 0.257 means that every one-unit increase in the quality of laboratory services will increase patient satisfaction by 0.257 units. The positive coefficient confirms that the relationship between the two variables is positive and in the same direction; hence, the better the quality of laboratory services provided, the higher the level of patient satisfaction.

Substantively, these regression results indicate that aspects of laboratory services, such as the accuracy of examination procedures, clarity of test results, staff meticulousness, speed of service, and the friendly and professional attitude of laboratory personnel, contribute significantly to patient satisfaction. Therefore, the resulting regression model provides empirical evidence that laboratory service quality is an important factor influencing patient satisfaction at Puskesmas Ajung, Jember Regency.

b. Hypothesis Testing

Hypothesis testing was conducted to determine whether the laboratory service quality variable truly has an effect on patient satisfaction at Puskesmas Ajung, Jember Regency. This stage was carried out through two tests: the F-test (ANOVA) to examine the overall influence of the regression model, and the t-test to assess the partial effect of the independent variable.

Table 8. F-test (ANOVA)

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	97.088	1	97.088	15.338	.000[b]
	Residual	215.218	34	6.330		
	Total	312.306	35			

a. Dependent Variable: Patient Satisfaction
b. Predictors: (Constant), Lab Quality

Based on the ANOVA output, the results show that the calculated F value is 15.338 with a significance value of 0.000, degrees of freedom for regression equal to 1, and degrees of freedom for residual equal to 34. Since the significance value of 0.000 is less than the 0.05 significance level, the regression model is considered statistically significant. This indicates that, overall, laboratory service quality has a significant effect on patient satisfaction. The relatively large F value also demonstrates that the regression model has good predictive ability in explaining variations in patient satisfaction. Therefore, the decision of the F-test is that the null hypothesis (H_0), which states that laboratory service quality has no effect on patient satisfaction, is rejected, while the alternative hypothesis (H_1), which states that laboratory service quality has an effect on patient satisfaction, is accepted.

These results indicate that laboratory service quality simultaneously makes a meaningful contribution to the improvement of patient satisfaction. Furthermore, partial hypothesis testing was conducted using the Coefficients table. Based on the SPSS output, the following values were obtained:

Table 9. T-test

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	28.909	4.292		6.735	.000
	Lab Quality	.257	.066	.558	3.916	.000

a. Dependent Variable: Patient Satisfaction

The results of the partial hypothesis testing indicate that the calculated t value is 3.916 with a significance level of 0.000, a regression coefficient (B) of 0.257, and a standard error of 0.066. Since the significance value is lower than 0.05 and the calculated t value (3.916) exceeds the t table value (1.691) at df = 34 and $\alpha = 0.05$, laboratory service quality is proven to have a significant effect on patient satisfaction. This

finding implies that improvements in laboratory service quality are directly associated with higher levels of patient satisfaction.

Furthermore, the positive regression coefficient demonstrates a unidirectional relationship between laboratory service quality and patient satisfaction, meaning that better service quality leads to increased satisfaction. Service aspects such as the accuracy of examination procedures, clarity of laboratory result information, staff attentiveness, service speed, and the friendly and professional attitude of laboratory personnel contribute significantly to shaping patients' positive perceptions. Overall, these findings provide strong empirical evidence that laboratory service quality plays an important role in enhancing patient satisfaction at Puskesmas Ajung, Jember Regency, thereby confirming that the research hypothesis stating that laboratory service quality has a positive and significant effect on patient satisfaction is accepted.

c. Coefficient of Determination (R Square)

The coefficient of determination analysis was conducted to determine the extent to which the laboratory service quality variable contributes to explaining the variation in patient satisfaction. The R Square value was obtained from the Model Summary output in the simple linear regression analysis.

Table 10. Coefficient of Determination (R Square)

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.558[a]	.311	.291	2.516

a. Predictors: (Constant), Lab Quality

Based on the Model Summary table, the results show that the correlation coefficient (R) is 0.558, the R Square value is 0.311, the Adjusted R Square is 0.291, and the Standard Error of the Estimate is 2.516. The R value of 0.558 indicates that the relationship between laboratory service quality and patient satisfaction is moderate and tends to be strong. This finding suggests that improvements in laboratory service quality at Puskesmas Ajung are followed by a corresponding increase in patient satisfaction. Furthermore, the R Square value of 0.311 indicates that 31.1% of the variation in patient satisfaction can be explained by laboratory service quality. In other words, laboratory service quality contributes 31.1% to the increase or decrease in patient satisfaction.

Meanwhile, the remaining 68.9% is influenced by other factors outside the research model, such as patients' previous experiences with healthcare services, the speed of services in other units within the health center, the general attitude of healthcare personnel, the comfort of service facilities, as well as patients' psychological factors or individual expectations. These results indicate that although other factors also influence patient satisfaction, laboratory service quality remains a significant and relevant determinant of patient satisfaction at Puskesmas Ajung, Jember Regency.

5. Discussion

The results of this study indicate that laboratory service quality has a positive and significant effect on patient satisfaction at Ajung Public Health Center. This is evidenced by the results of the simple linear regression analysis, which show a regression coefficient of 0.257 with a significance value of 0.000, which is lower than the alpha level of 0.05. These findings indicate that the better the quality of laboratory services perceived by patients, the higher the level of patient satisfaction with the services received. The correlation coefficient (R) of 0.558 suggests a moderately strong relationship between laboratory service quality and patient satisfaction, while the coefficient of determination (R Square) of 0.311 indicates that 31.1% of the variation in patient satisfaction can be explained by laboratory service quality, with the remaining percentage influenced by other factors outside the scope of this study.

These findings are consistent with the service quality theory proposed by Parasuraman et al. through the SERVQUAL model, which states that customer satisfaction is influenced by perceptions of service quality across five dimensions: reliability, responsiveness, assurance, empathy, and tangibles. In the context of laboratory services at Ajung Public Health Center, these dimensions are reflected in the accuracy of examination results, the promptness and responsiveness of laboratory staff, professional competence and the ability to provide a sense of security, courteous and attentive communication with patients, as well as the condition and cleanliness of

laboratory facilities. Positive patient perceptions of these aspects contribute significantly to higher levels of satisfaction.

Furthermore, the results of this study are in line with previous studies conducted by Ningsih (2020), Putri (2020), and Zulkarnain (2020), which found that laboratory service quality has a significant effect on patient satisfaction. Similarly, studies by Hidayah (2022) and Wulandari & Putro (2023) reported that staff professionalism, service speed, and adequate laboratory facilities play important roles in shaping patient satisfaction. Therefore, this study strengthens existing empirical evidence that improving laboratory service quality is a strategic factor in enhancing patient satisfaction, particularly in primary healthcare facilities such as public health centers.

CONCLUSION

Based on the data analysis results, it can be concluded that laboratory service quality has a positive and significant effect on patient satisfaction at Puskesmas Ajung. The service quality dimensions, including reliability, responsiveness, assurance, empathy, and tangibles, play a crucial role in shaping patients' perceptions and experiences during laboratory services. The findings indicate that the better the quality of services provided particularly in terms of service speed, clarity of information, staff professionalism, and facility comfort the higher the level of patient satisfaction. These results underscore that improving laboratory service quality is a strategic factor in enhancing the quality of primary healthcare services and increasing public trust in Puskesmas.

Based on these findings, it is recommended that Puskesmas management continuously improve laboratory service quality by enhancing service efficiency, strengthening staff communication, and upgrading supporting facilities. Healthcare staff are also expected to maintain professionalism, improve responsiveness, and provide clear information to patients. Furthermore, future researchers are encouraged to expand this study by including additional variables such as waiting time, patient trust, or service innovation, as well as using larger sample sizes and different research approaches to obtain more comprehensive results. In addition, policymakers are advised to support improvements in laboratory service standards through training programs and infrastructure development in primary healthcare facilities.

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