

THE EFFECT OF SERVICE QUALITY ON PATIENT LOYALTY WITH PATIENT SATISFACTION AS A MEDIATION VARIABLE AND SERVICE RATES AS A MODERATING VARIABLE IN LABKESDA, TANGERANG CITY

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Abstract

This study aims to analyze the mechanism of patient loyalty formation at the Tangerang City Health Laboratory Technical Implementation Unit (UPT Labkesda) by examining the direct and indirect influence of service quality through mediation of patient satisfaction, as well as the moderating role of service rates. The research method used is quantitative associative causal. Data were collected through questionnaires to 100 respondents with consecutive sampling technique. Data analysis used Structural Equation Modeling based on Partial Least Squares (PLS-SEM). The test results show that: (1) Service quality has a positive and significant effect on patient satisfaction (path coefficient = 0.707; $p = 0.000$); (2) Patient satisfaction has a positive and significant effect on patient loyalty (path coefficient = 0.255; $p = 0.012$); (3) Service quality has a strong direct influence on patient loyalty (path coefficient = 0.561; $p = 0.000$); (4) Patient satisfaction partially mediates the relationship between service quality and loyalty (indirect coefficient = 0.180; $p = 0.015$); and (5) Service rates significantly moderate and strengthen the relationship between service quality and patient loyalty (interaction coefficient = 0.213; $p = 0.007$). This model has a predictive power of 69.0% for patient loyalty. These findings confirm that cognitive trust in laboratory technical quality is a major retention factor, and competitive rates serve as a catalyst for strengthening this loyalty.

Keywords: *Service Quality, Patient Satisfaction, Patient Loyalty, Service Rates, PLS-SEM.*

INTRODUCTION

Patient loyalty is one of the most important performance indicators in the provision of public healthcare services. Loyalty not only reflects the continuity of patient use of services but also indicates the level of trust, perceived value, and reputation of a healthcare institution in the eyes of the public. Loyal patients are more likely to make repeat visits, use services consistently, and recommend healthcare facilities to others (Aribowo et al., 2024; Haeruddin, 2023). In the context of regional health laboratories (Labkesda), patient loyalty is crucial because it is related to the optimal utilization of public facilities, the stability of service volume, and the accountability of regional resource management.

Empirical data at the Tangerang City Health Laboratory (Labkesda) shows a decline in patient visits, from 7,364 in 2024 to 7,050 in 2025. Furthermore, the proportion of patients with more than one visit also decreased from 23.13% to 21.86% during the same period. This decline indicates the challenge of maintaining patient loyalty amidst increasing competition from the growing number of private clinical laboratories. Conceptually, patient loyalty is influenced by service quality, patient satisfaction, and service rates. Service quality, through the SERVQUAL dimensions—tangibles, reliability, responsiveness, assurance, and empathy—is a factor that can be directly controlled by Labkesda management. Patient satisfaction acts as a mediating variable because it represents the patient's affective response to the service experience they receive. Meanwhile, service rates were chosen as a moderating variable considering that cost is a sensitive factor in public health services that can strengthen or weaken the influence of quality on loyalty. Previous research has shown inconsistent findings: some studies state that service quality has a direct effect on patient loyalty (Aribowo et al., 2024), while others show that this effect is only significant through mediation by patient satisfaction (Sholeh & Chalidyanto, 2021). Research in the context of public health laboratories

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is still very limited. This research gap prompted this study at the Tangerang City Public Health Laboratory Technical Implementation Unit (UPT Labkesda), with the aim of analyzing: (1) the effect of service quality on patient satisfaction; (2) the effect of patient satisfaction on patient loyalty; (3) the direct effect of service quality on patient loyalty; (4) the mediating role of patient satisfaction; and (5) the moderating role of service rates.

LITERATURE REVIEW

Patient Loyalty

Patient loyalty is defined as a deep commitment to consistently use healthcare services in the future, manifested through repeat visits and recommendations to others, despite situational influences and marketing efforts that could potentially lead to behavioral switching (Aribowo et al., 2024). In the context of healthcare laboratories, loyalty is measured through four main indicators: (1) repeat visits for various types of examinations; (2) recommendations of services to others (word of mouth); (3) providing positive comments or testimonials; and (4) resistance to competing laboratory offers (Patyawati, 2017).

Quality of Service

Service quality in the context of Labkesda is the degree of excellence of laboratory services assessed based on the institution's ability to meet or exceed patient expectations. Service quality is measured using the SERVQUAL model, which includes five dimensions: (1) tangibles—comfort and cleanliness of the waiting room, modern equipment, and staff appearance; (2) reliability—accuracy of results and timeliness; (3) responsiveness—speed of staff response; (4) assurance—competence and trustworthiness; and (5) empathy—individual attention to patients (Puspita & Paramata, 2024).

Patient Satisfaction

Patient satisfaction is the level of positive feelings that arise from a comparative evaluation between patient expectations before visiting and the perception of actual performance received during the laboratory examination process (Kotler & Keller, 2016). Satisfaction is measured through three indicators: (1) the match between expectations and the reality of the service; (2) satisfaction with the service process (registration flow to sample collection); and (3) satisfaction with the results of the service, especially the accuracy and reliability of laboratory examination results.

Service Rates

Service fees are the amount of fees set by regional regulations as compensation for laboratory examination services. Patient perceptions of fees are measured using four indicators: (1) affordability; (2) price-quality match; (3) competitiveness of fees compared to other laboratories; and (4) fairness and transparency of fees (Suaeb, 2023; Astari et al., 2025).

Conceptual Framework and Hypothesis

Based on theoretical studies and previous research, this study proposes five hypotheses: H1: Service quality has a positive effect on patient satisfaction. H2: Patient satisfaction has a positive effect on patient loyalty. H3: Service quality has a positive effect on patient loyalty. H4: Patient satisfaction mediates the effect of service quality on patient loyalty. H5: Service rates moderate the effect of service quality on patient loyalty.

RESEARCH METHODS

This study used a causal associative quantitative design with a cross-sectional approach. The study population was all patients visiting the Tangerang City Health Laboratory (UPT Labkesda) (total visits in 2025: 7,050 patients). A sample of 100 respondents was drawn using consecutive sampling, following the Hair et al. (2019) principle of 5–10 times the number of indicators (16 indicators). Data collection was conducted through a closed questionnaire with a five-point Likert scale. The variables in this study include: (1) independent variable—service quality (5 indicators); (2) dependent variable—patient loyalty (4 indicators); (3) mediating variable—patient satisfaction (3 indicators); and (4) moderating variable—service rates (4 indicators). Data analysis used Structural Equation Modeling based on Partial Least Squares (PLS-SEM) with SmartPLS software. Model evaluation includes outer model (convergent validity through loading factor value > 0.70 and AVE > 0.50 ; discriminant validity through Fornell-Larcker criteria and cross loading; reliability through Composite Reliability > 0.70 and Cronbach's Alpha > 0.60) and inner model

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(determination coefficient R^2 and hypothesis testing through bootstrapping with T-statistic criteria > 1.96 and p-value < 0.05).

RESULTS AND DISCUSSION

Respondent Characteristics

The study involved 100 respondents with the following profiles: gender dominated by men (52%) and women (48%); majority age 21–30 years (54%) followed by 31–40 years (19%); education dominated by bachelor's degree (43%) and high school (42%); majority occupation employees (49%), unemployed (16%), and teachers (14%); the largest monthly income in the range of Rp 3,000,001–Rp 6,000,000 (54%). This profile shows that the main users of Labkesda are the productive age group with secondary to higher education from the middle economic segment.

Descriptive analysis showed positive assessments across all variables. Service quality scored an average of 4.12 (out of 5), with the highest score being on the staff competency indicator (4.13). Patient satisfaction scored an average of 4.11, with satisfaction with service flow (4.12) as the dominant indicator. Service rates scored an average of 3.89, lower than other variables, with affordability being the strongest indicator (3.91). Patient loyalty scored an average of 4.11, with willingness to provide positive feedback (4.13) as the highest indicator.

Outer Model Test Results

All indicators met the convergent validity requirements with loading factor values above 0.70, ranging from 0.732 to 0.920. AVE values also met the requirements: service quality (0.687), patient satisfaction (0.663), service rates (0.755), and patient loyalty (0.612). Discriminant validity tests using the Fornell-Larcker criteria showed that the square root of the AVE of each variable was greater than its correlation with other variables, proving the uniqueness of each construct. Reliability tests showed Composite Reliability values ranging from 0.855–0.925 and Cronbach's Alpha ranging from 0.745–0.894, all exceeding the threshold of 0.70. Thus, all research instruments were declared valid and reliable.

Inner Model and Hypothesis Test Results

The coefficient of determination (R^2) indicates that service quality explains 50.0% of the variation in patient satisfaction. Meanwhile, the combination of service quality, patient satisfaction, and the moderating effect of service rates explains 69.0% of the variation in patient loyalty—a relatively strong predictive power.

The results of hypothesis testing through bootstrapping are presented as follows:

H1 is accepted: Service quality has a positive and significant effect on patient satisfaction (path coefficient = 0.707; T-statistic = 13.699; $p = 0.000$). The coefficient value of 0.707 is the highest in the model, confirming service quality as the most dominant predictor of patient satisfaction. This high coefficient is explained by the nature of laboratory services as credence services, where patients use visible quality cues—such as staff competence, cleanliness, and speed of service—as proxies for assessing technical quality that they cannot independently verify.

H2 is accepted: Patient satisfaction has a positive and significant effect on patient loyalty (path coefficient = 0.255; T-statistic = 2.263; $p = 0.012$). Although significant, this coefficient is lower than the direct effect of service quality, indicating that satisfaction at Labkesda is only at an acceptable level and has not yet reached the delighted stage, which is a prerequisite for true loyalty.

H3 is accepted: Service quality has a positive and significant direct effect on patient loyalty (path coefficient = 0.561; T-statistic = 5.576; $p = 0.000$). This direct effect is even greater than the path through satisfaction mediation, indicating the dominance of cognitive loyalty based on trust in laboratory technical competence.

H4 is accepted: Patient satisfaction significantly mediates the effect of service quality on patient loyalty with a partial mediation pattern (indirect coefficient = 0.180; T-statistic = 2.182; $p = 0.015$). The partial mediation pattern implies that service quality works through two simultaneous pathways: a direct cognitive pathway that builds trust, and an indirect affective pathway through satisfaction.

H5 is accepted: Service rates significantly moderate and strengthen the effect of service quality on patient loyalty (interaction coefficient = 0.213; T-statistic = 2.448; $p = 0.007$). Rates act as a boundary condition: rates perceived as fair and competitive strengthen the impact of quality on loyalty, whereas rates perceived as disproportionate weaken the effect.

Discussion

The very strong influence of service quality on patient satisfaction (0.707) is consistent with research by Anisa et al. (2025) in clinical pathology laboratories and Nuryanti et al. (2025) which proved quality as a dominant

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predictor of satisfaction. The dominance of respondents aged 21–30 years (54%) who are employees (49%) makes an important contribution: this group has high efficiency standards and values quality not only in terms of friendliness, but also time efficiency and accuracy of results—which are the main determinants of their satisfaction. The relatively moderate effect of satisfaction on loyalty (0.255) reveals a psychological reality in the context of public healthcare. Satisfaction is a conditional necessity—a necessary but not sufficient condition for loyalty. The phenomenon of the loyalty trap, where loyalty is formed not from affection but from limited options (Oliver, 2014), may explain why existing satisfaction has not fully converted into strong loyalty.

The direct effect of service quality on loyalty is greater (0.561) than the path through satisfaction (0.180), indicating the dominance of cognitive loyalty based on trust in laboratory technical accuracy. For highly educated respondents (S1: 43%), trust in the reliability of clinical results is a primary prerequisite for making a long-term loyalty commitment, as confirmed by Guspianto et al. (2023) and Aribowo et al. (2024). The moderating role of service rates (0.213) empirically proves that rates serve as a reinforcing factor in building loyalty. For the middle-income segment that dominates respondents (income of Rp 3–6 million/month), the perception of fairness of rates is a real consideration in their loyalty decisions, in line with the value-for-money principle (Parasuraman et al., 1988). The dynamics of competition that show a narrowing price gap between Labkesda and private laboratories for several examination parameters make tariff management an urgent strategic issue.

CONCLUSION

Based on the results of data analysis, this study concludes:

First, service quality was the strongest predictor of patient satisfaction at the Tangerang City Labkesda UPT (path coefficient = 0.707; $p = 0.000$). The characteristics of laboratory services as credence services make visible quality cues—particularly staff competence and flow efficiency—the primary proxies for patient assessment.

Second, patient satisfaction has a positive and significant effect on loyalty (path coefficient = 0.255; $p = 0.012$), but satisfaction is only at an acceptable level and has not yet reached the delighted stage needed to produce stronger loyalty.

Third, service quality has a more dominant direct effect on loyalty (path coefficient = 0.561; $p = 0.000$) compared to the path through satisfaction mediation. Cognitive trust in the laboratory's technical accuracy—especially for the highly educated employee segment—is the strongest retention factor.

Fourth, patient satisfaction partially mediates the effect of service quality on loyalty (indirect coefficient = 0.180; $p = 0.015$). The partial mediation pattern indicates that quality operates through both a direct cognitive pathway and an affective pathway through satisfaction simultaneously.

Fifth, service rates significantly moderate and strengthen the influence of service quality on loyalty (interaction coefficient = 0.213; $p = 0.007$). Perceived reasonable and competitive rates serve as a catalyst for loyalty formation among the middle-income segment.

SUGGESTION

For the Tangerang City Labkesda UPT

Management is advised to implement transparent service time standards (SLAs) in waiting areas to mitigate wait time complaints. Implementing a real-time, QR code-based feedback system is necessary to detect quality declines early. Interpersonal training for staff, focusing on empathetic communication, should be made an annual routine. Visualizing evidence of equipment accreditation and certification in public areas will strengthen the assurance dimension, which underpins patient cognitive loyalty. To close the satisfaction mediation gap, Labkesda needs to adopt automatic notifications via WhatsApp when test results are ready, implement a service recovery protocol within a maximum of 24 hours, and differentiate between captive patient strategies (focusing on technical efficiency) and voluntary patient strategies (focusing on empathy and personalization). Regarding pricing, price benchmarking every six months against at least three competing laboratories in Tangerang City is necessary, with active communication of pricing advantages through infographics on social media.

For the Tangerang City Health Service

The Health Office is advised to implement a performance-based budget policy with satisfaction and repeat visit indicators, support equipment maintenance and ISO 15189 international accreditation, and encourage the integration of Labkesda visit data into the regional health information system for longitudinal patient loyalty monitoring. The retribution tariff policy needs to be reviewed dynamically and evidence-based to maintain both fairness and operational sustainability.

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For Further Researchers

It is recommended that future research: (1) explore additional moderating variables such as accessibility, home visit services, and speed of access to digital results; (2) use a 12–24 month longitudinal design to measure loyalty stability over time; (3) replicate the model in other district/city Labkesda to test generalizability; and (4) consider trust and institutional image variables as additional relevant mediators in the context of public services.

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