

## Hospital Image and Laboratory Service Quality on Customer Loyalty: Mediating Role of Customer Satisfaction

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### Abstract

*This study aimed to analyze the effects of hospital image and laboratory service quality on customer loyalty, considering the mediating role of customer satisfaction. The research was conducted at Restu Ibu Hospital Balikpapan using a quantitative approach with a causal design. A total of 163 respondents were selected through purposive sampling. Data were collected via questionnaires and analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM). Hospital image had a significant direct effect on customer loyalty ( $\beta = 0.325$ ;  $p = 0.031$ ), while laboratory service quality did not have a significant direct effect ( $\beta = 0.037$ ;  $p = 0.683$ ). Customer satisfaction had a significant effect on customer loyalty ( $\beta = 0.528$ ;  $p < 0.001$ ) and mediated the relationship between hospital image ( $\beta = 0.207$ ;  $p = 0.001$ ) and laboratory service quality ( $\beta = 0.246$ ;  $p = 0.027$ ) with customer loyalty. The model Goodness of Fit (GoF) value of 0.717 indicated an excellent model fit. These findings highlight the importance of strengthening institutional image and improving laboratory service quality as key strategies to enhance customer loyalty in the hospital setting.*

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## 1. INTRODUCTION

Globalization has intensified competition across all sectors. Healthcare organizations such as hospitals and clinics face growing demands for high-quality services that can satisfy and retain their patients. The healthcare and social services sector in Indonesia contributed approximately 1% to national GDP, yet has grown steadily over the past decade, with GDP in this sector rising from IDR 109.147 trillion in 2014 to IDR 251.999 trillion in 2023 (Statistics Indonesia, 2024). The number of general hospitals in Indonesia also increased from 2,344 units in 2019 to 2,636 units in 2023 (Ministry of Health of the Republic of Indonesia, 2024), intensifying competition in the healthcare services market.

In this competitive landscape, customer loyalty has become a central concern for hospital management. Loyalty is defined as a commitment to repurchase or resubscribe to a preferred product or service in the future despite situational influences and marketing efforts that may induce switching behavior [1]. Loyal patients not only return for subsequent visits but also recommend hospital services to others, thereby reducing marketing costs and enhancing the institution's competitive position [2].

Among the key antecedents of customer loyalty in healthcare, hospital image and service quality stand out as critical determinants. Hospital image refers to the overall perception customers hold toward the institution, shaped by beliefs, impressions, and accumulated knowledge [1]. A positive hospital image serves as a filter for patient

perceptions, maintaining favorable evaluations even in the presence of minor service shortcomings [3]. Service quality, on the other hand, reflects the degree to which delivered services meet or exceed patient expectations [4]. Healthcare organizations must consistently provide high-quality service to cultivate positive perceptions that drive loyalty [5].

Customer satisfaction functions as an important mediator between these antecedents and loyalty. When patients feel their expectations are met or exceeded, satisfaction is generated, which in turn fosters loyal behavior [6]. Prior studies in hospital settings have confirmed that both hospital image and service quality positively influence satisfaction [7,8], and that satisfaction significantly predicts loyalty [9,10].

A gap exists, however, in research focusing specifically on laboratory services as a dimension of hospital service quality. Laboratory services play a pivotal diagnostic role; errors in this domain represent approximately one-third of all medical errors, which collectively constitute the third leading cause of death in the United States [11]. Despite this critical role, few studies have examined whether laboratory service quality directly or indirectly through satisfaction shapes overall patient loyalty to the hospital. Existing studies tend to focus on general outpatient, inpatient, or emergency services [7,10,12].

This study was conducted at Restu Ibu Hospital in Balikpapan, a general hospital established in 1976 and currently holding the highest level of hospital accreditation (paripurna). The study aimed to analyze the effects of hospital image and laboratory service quality on customer loyalty with customer satisfaction as a mediating variable.

Based on this background, the research questions are: (1) Does hospital image affect customer satisfaction? (2) Does hospital image affect customer loyalty? (3) Does customer satisfaction mediate the effect of hospital image on customer loyalty? (4) Does customer satisfaction affect customer loyalty? (5) Does laboratory service quality affect customer satisfaction? (6) Does laboratory service quality directly affect customer loyalty? (7) Does customer satisfaction mediate the effect of laboratory service quality on customer loyalty?

## 2. RESEARCH METHOD

Menjelaskan This study employed a quantitative approach with a causal research design. The research was conducted at Restu Ibu Hospital Balikpapan between April and June 2025. The population comprised all patients or patient guardians who had used the laboratory services at this hospital. Using the formula recommended by Hair et al. [13], with 26 observed indicators in the model, the minimum required sample size was 140 respondents. A total of 163 respondents were obtained through purposive sampling, fulfilling the minimum requirement.

Data were collected using a structured self-administered questionnaire with a five-point Likert scale (1 = strongly disagree to 5 = strongly agree). The questionnaire measured four variables: hospital image (X1), measured by 4 indicators adapted from Kotler and Keller [1] and Nguyen et al. [14]; laboratory service quality (X2), measured by 14 indicators using the SERVQUAL dimensions (tangibles, reliability, responsiveness, assurance, empathy) adapted from Parasuraman et al. in Tjiptono and Chandra [4]; customer satisfaction (Z), measured by 5 indicators adapted from Tjiptono and Chandra [4]; and customer loyalty (Y), measured by 3 indicators adapted from Aaker [15].

Data were analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM) through SmartPLS software. The PLS-SEM approach was selected because it is suitable for complex models with multiple mediating variables and is robust to non-normal data distributions [16]. The analysis covered three main evaluations: (1) convergent validity, assessed by outer loadings ( $> 0.70$ ) and Average Variance Extracted (AVE  $>$

0.50); (2) discriminant validity, assessed by the Fornell-Larcker criterion and HTMT ratios ( $< 0.85$ ); and (3) construct reliability, assessed by Cronbach's alpha ( $> 0.60$ ) and composite reliability ( $> 0.70$ ). Model fit was evaluated using the Goodness of Fit (GoF) index, calculated as the geometric mean of the average AVE and average R-squared values. Hypothesis testing was conducted via bootstrapping with 5,000 subsamples [17].

### 3. RESULTS AND DISCUSSION

#### 3.1. Results

Xxx Of the 163 respondents, 60.7% were female and 39.3% male, with the majority (81.6%) having completed tertiary education. The largest income group (39.9%) earned between IDR 2,000,000 and IDR 5,000,000 per month, and 39.3% of respondents had visited the hospital between two and five times, reflecting a moderate level of ongoing engagement with its services.

Descriptive statistics revealed consistently positive perceptions across all variables, with overall mean scores exceeding 4.00 on a five-point Likert scale. Hospital image (X1) achieved a mean of 4.02, with the reputation indicator scoring highest at 4.10. Laboratory service quality (X2) produced a mean of 4.12, led by the staff appearance indicator at 4.18. Customer satisfaction (Z) and customer loyalty (Y) recorded means of 4.07 and 4.03, respectively, indicating that respondents generally felt satisfied and inclined toward loyal behavior.

All indicators demonstrated outer loadings above 0.70 and Average Variance Extracted (AVE) values above 0.50, confirming convergent validity. For hospital image, outer loadings ranged from 0.876 to 0.921 with AVE = 0.809; for laboratory service quality, from 0.765 to 0.921 with AVE = 0.776; for customer satisfaction, from 0.860 to 0.910 with AVE = 0.787; and for customer loyalty, from 0.936 to 0.954 with AVE = 0.898. Discriminant validity was established through the Fornell-Larcker criterion, where each construct's square root AVE exceeded all inter-construct correlations, and HTMT ratios were below 0.85 throughout. Cronbach's alpha and composite reliability values exceeded 0.90 for all constructs, confirming high internal consistency. The overall Goodness of Fit (GoF) index was 0.717, derived from an average AVE of 0.818 and an average R-squared of 0.629 (customer satisfaction:  $R^2 = 0.596$ ; customer loyalty:  $R^2 = 0.662$ ), indicating an excellent model fit.

Hypothesis testing via bootstrapping revealed that hospital image significantly and directly affected both customer satisfaction ( $\beta = 0.392$ ;  $p = 0.008$ ) and customer loyalty ( $\beta = 0.325$ ;  $p = 0.031$ ), supporting H1 and H2. The indirect effect of hospital image on loyalty through customer satisfaction was also significant ( $\beta = 0.207$ ;  $p = 0.001$ ), confirming the mediating role of satisfaction and supporting H3. Customer satisfaction itself had the strongest direct effect on loyalty ( $\beta = 0.528$ ;  $p < 0.001$ ), supporting H4. Laboratory service quality significantly influenced customer satisfaction ( $\beta = 0.466$ ;  $p < 0.001$ ), supporting H5, but did not exert a significant direct effect on customer loyalty ( $\beta = 0.037$ ;  $p = 0.683$ ), failing to support H6. However, its indirect effect on loyalty through customer satisfaction was significant ( $\beta = 0.246$ ;  $p = 0.027$ ), supporting H7.

These findings carry several important theoretical and practical implications. The direct effect of hospital image on loyalty is consistent with legitimacy theory [18], which holds that institutions maintaining reputations aligned with societal values cultivate the trust necessary for sustained customer patronage. This corroborates findings by Ramli [19] and Listyorini et al. [20], who similarly identified hospital image as a significant loyalty driver. The confirmed mediating role of satisfaction further supports the argument that positive image perceptions generate emotional fulfillment

in patients, which then consolidates into loyalty over repeated service encounters. The absence of a direct path from laboratory service quality to loyalty, while initially counterintuitive, aligns with Dewi et al. [21], who reported a parallel non-significant direct path in a similar clinical laboratory context. Laboratory services occupy a supporting rather than primary role in the patient experience; patients may not cognitively link diagnostic support services to their overall hospital loyalty unless a salient service failure occurs. Nevertheless, the significant indirect path confirms that when laboratory services are perceived as high quality, patient satisfaction rises, and that satisfaction reliably translates into loyalty, highlighting the importance of investing in all service touchpoints rather than front-line care alone.

### 3.2. Discussions

The finding that hospital image directly and significantly affects customer loyalty ( $\beta = 0.325$ ;  $p = 0.031$ ) is theoretically grounded in legitimacy theory, which posits that organizations actively manage their public standing to align with the norms and values of society [18]. When a hospital successfully builds and maintains a credible image, it reduces the perceived risk patients associate with choosing its services, effectively lowering the psychological barrier to repeat utilization. This mechanism is particularly salient in healthcare, where the intangibility of services makes image one of the few pre-consumption cues available to prospective patients [3]. A strong institutional image functions as a cognitive shortcut: patients who hold a favorable impression of the hospital are more likely to return for future healthcare needs and less susceptible to switching behavior induced by competitors' promotional efforts. This finding is consistent with Ramli [19], who demonstrated that hospital image significantly predicts patient loyalty in a West Sulawesi hospital context, with Listyorini et al. [20], who found hospital image and service quality to be co-determinants of loyalty, and with Phonthanukitithaworn et al. [22], who reported that medical center image positively influenced quality perceptions and loyalty in a Southeast Asian healthcare market. From a managerial standpoint, hospital management must invest in systematic reputation-building activities, including professional credentialing of medical staff, transparent communication of accreditation achievements, and proactive community engagement. In the context of Restu Ibu Hospital Balikpapan, which holds the highest level of hospital accreditation (paripurna), communicating this achievement more effectively to the public could further strengthen perceived image and reinforce existing loyalty.

The significant indirect path from hospital image to customer loyalty via customer satisfaction ( $\beta = 0.207$ ;  $p = 0.001$ ) confirms that satisfaction partially mediates this relationship, aligning with the theoretical framework advanced by Vimla and Taneja [23], who identified satisfaction as a partial mediator between image and loyalty in healthcare settings. The logic follows a sequential cognitive-affective process: a positive institutional image shapes favorable expectations; when actual service encounters confirm or exceed those expectations, satisfaction is generated; and cumulative satisfaction episodes solidify into attitudinal and behavioral loyalty. The co-existence of a significant direct path (H2) and a significant indirect path (H3) indicates partial mediation, implying that image exerts an autonomous influence on loyalty beyond its effect through satisfaction. This suggests that some patients may develop loyalty based on institutional reputation alone, even prior to fully processing their satisfaction judgments, a pattern observed in other high-involvement service contexts where brand image carries strong symbolic value [3,7]. In practical terms, partial

mediation means that hospital management cannot rely solely on enhancing satisfaction to build loyalty; they must simultaneously manage the hospital's public image through external communications and reputation governance.

Customer satisfaction emerged as the strongest direct predictor of customer loyalty in this study ( $\beta = 0.528$ ;  $p < 0.001$ ), which is consistent with the well-established satisfaction-loyalty paradigm in services marketing [1,4]. The magnitude of this coefficient underscores the primacy of satisfaction as the most proximal antecedent of loyalty in healthcare. When patients feel that the hospital has delivered on its service promises, met their health-related needs, and treated them respectfully, the resulting emotional and cognitive fulfillment creates a compelling reason to return and recommend the hospital to others. This finding resonates with expectancy-disconfirmation theory, which holds that satisfaction arises when perceived performance meets or exceeds pre-service expectations [1]. In the healthcare context, where patients enter with elevated vulnerability and often heightened expectations, exceeding these expectations generates disproportionately strong satisfaction responses. Nguyen et al. [9] corroborated this by finding satisfaction to be the most influential predictor of loyalty among in-patients in a developing country context, while Setyawan et al. [10] confirmed the satisfaction-loyalty link across both public and private primary care settings in Indonesia. These parallel findings reinforce the argument that satisfaction is not merely a transactional outcome but a long-term relational construct that forms the bedrock of customer loyalty in healthcare.

Laboratory service quality significantly influenced customer satisfaction ( $\beta = 0.466$ ;  $p < 0.001$ ), confirming that the SERVQUAL dimensions of tangibles, reliability, responsiveness, assurance, and empathy are applicable and relevant to ancillary diagnostic services. This aligns with Prajati and Parawati Bala [24], who reported that service quality dimensions significantly predicted satisfaction in a clinical laboratory context, and with Byaene Alain et al. [25], who found that laboratory service quality was a key driver of patient satisfaction in a university hospital setting. The relatively high mean scores across all 14 laboratory service quality indicators (overall mean = 4.12) suggest that patients at Restu Ibu Hospital Balikpapan generally perceived laboratory services favorably. Among the dimensions measured, items related to staff conduct, comprising assurance and empathy, received the highest ratings, indicating that interpersonal aspects of service delivery are particularly valued by patients when evaluating laboratory quality, consistent with the SERVQUAL literature which consistently finds that human interaction dimensions exert stronger influences on satisfaction than physical or procedural ones in service-intensive industries [4].

The absence of a significant direct path from laboratory service quality to customer loyalty ( $\beta = 0.037$ ;  $p = 0.683$ ) is one of the most theoretically interesting findings of this study. While counterintuitive at first glance, it is consistent with Dewi et al. [21], who reported a similarly non-significant direct quality-loyalty link in a combined clinic and laboratory setting. This pattern can be explained through the role of service context salience: laboratory services, while critical to clinical outcomes, occupy a peripheral position in the patient's conscious evaluation of the overall hospital experience. Unlike a physician consultation or nursing care interaction, laboratory testing is often perceived as a technical, process-driven encounter rather than a relational one, reducing its direct psychological impact on loyalty formation. This finding is further interpretable within attribution theory: patients are unlikely to attribute their overall hospital loyalty directly to laboratory service quality unless a salient service failure in that domain occurs. In the absence of negative experiences, which the high mean scores

suggest is the case here, patients may not consciously credit the laboratory for their loyalty even though its quality indirectly sustains it through satisfaction. The implication is that laboratory service quality improvements may not produce immediate, observable shifts in loyalty metrics, but their cumulative contribution through the satisfaction pathway makes them strategically indispensable.

The confirmation of full mediation for the laboratory service quality-loyalty relationship ( $H7$ ;  $\beta = 0.246$ ;  $p = 0.027$ ), combined with the non-significant direct path, reveals that customer satisfaction is the exclusive channel through which laboratory service quality translates into customer loyalty. This finding carries significant implications for hospital service management: investments in laboratory infrastructure, staff training, and process improvement deliver their returns not as direct loyalty dividends but as satisfaction increments that compound into loyalty over repeated service encounters. From a theoretical standpoint, this full mediation pattern extends the service quality-satisfaction-loyalty chain [4,5] specifically to a diagnostic support service rather than a primary care interaction, broadening the applicability of the theoretical framework to ancillary healthcare services. Future research could examine whether this full mediation holds across other types of ancillary services such as radiology, pharmacy, or rehabilitation, or whether a direct quality-loyalty link emerges in settings where laboratory services play a more central role in patient care, such as oncology or chronic disease management clinics.

#### 4. CONCLUSION

This study demonstrated that hospital image directly and indirectly (through customer satisfaction) affects customer loyalty. Laboratory service quality indirectly affects customer loyalty through customer satisfaction, but does not have a significant direct effect on loyalty. Customer satisfaction serves as a significant partial mediator for the hospital image-loyalty relationship and a full mediator for the laboratory service quality-loyalty relationship. The Goodness of Fit value of 0.717 indicated that the research model had an excellent fit.

Hospital management at Restu Ibu Hospital Balikpapan is advised to continuously strengthen institutional image through transparent communication, consistent professional conduct, and proactive reputation management. Simultaneously, improving laboratory service quality through staff training, equipment modernization, and quality management systems is essential for building patient satisfaction that leads to loyalty. Regular patient satisfaction surveys and complaint management systems should be implemented to monitor and continuously improve patient experiences.

Future research may consider incorporating additional variables such as patient trust, perceived value, or hospital accreditation status, and extend the study to multiple hospital settings for greater generalizability.

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