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The Effectiveness of Service Quality on Patient Satisfaction Based on Outpatient and Inpatient Services

Yusufa Ibnu Sina Setiawan
Universitas Ciputra, Indonesia

Hastuti Naibaho*
Universitas Ciputra, Indonesia

Fahrul Riza
Universitas Ciputra, Indonesia

***Corresponding author:**
Hastuti Naibaho, Universitas Ciputra, Indonesia. ✉hastuti.naibaho@ciputra.ac.id

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Abstract

Background: Competition among private maternal and child hospitals requires service quality improvement that addresses both clinical performance and the overall patient experience.
Objective: This study examined how HEALTHQUAL dimensions (empathy, tangibles, safety, efficiency, and degree of improvement of care services (DoI)) relate to patient satisfaction and whether the pattern differs between outpatient and inpatient services at Melati Husada Hospital (MH) and Melati Children Hospital (MCH).
Methods: A quantitative explanatory repeated cross-sectional survey was conducted at both hospitals. The analysis included 625 respondents (324 at MH and 301 at MCH) with nearly balanced outpatient and inpatient groups. HEALTHQUAL measured service quality and KKP-2017 measured satisfaction. Cronbach's alpha and corrected item-total correlation assessed instrument quality, followed by descriptive analysis, independent-samples t-tests, and multiple linear regression.
Results: Inpatient satisfaction exceeded outpatient satisfaction at both hospitals (MH: 4.39 vs. 4.14; MCH: 4.29 vs. 4.04; $p < 0.001$). All regression models were significant. DoI was the most consistent predictor across hospital and admission models, followed mainly by efficiency and tangibles. Safety contributed significantly, particularly at MCH, whereas empathy showed no independent significant effect despite high descriptive scores. Open-ended comments similarly emphasized perceived improvement and tangible facilities.
Conclusion: Service improvement should prioritize perceived care outcomes, process efficiency, and physical facilities while maintaining interpersonal empathy and patient safety. Findings should be interpreted within the two-hospital setting and in light of ceiling effects and multicollinearity among HEALTHQUAL dimensions.

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INTRODUCTION

Private-hospital competition has increased expectations for service quality beyond clinical outcomes alone. Patient experience is also shaped by interactions with health professionals, service speed, perceived safety, facility comfort, and perceived treatment outcomes. Prior studies indicate that both interpersonal and physical service attributes influence satisfaction and loyalty (Chen et al., 2024; Darzi et al., 2023; Friedel et al., 2023). These considerations are especially important in maternal and child hospitals because pregnant women, infants, children, and accompanying families may have heightened emotional, informational, and safety needs (Almadana et al., 2025; Sharifi & Kalhor, 2025).

Measurement of healthcare service quality has moved from general service instruments toward context-specific models. SERVQUAL explains quality through reliability, assurance, tangibles, empathy, and responsiveness, but healthcare quality also depends on clinical safety, accuracy, efficiency, and perceived improvement. Instruments such as PUBHOSQUAL, HOSPITALQUAL, and HEALTHQUAL were developed to capture these healthcare-specific attributes. HEALTHQUAL comprises empathy, tangibles, safety, efficiency, and degree of improvement of care services (DoI) (Aagja & Garg, 2010; Acharyulu & Shekhar, 2014; Darzi et al., 2023; Endeshaw, 2021; Lee, 2016). Because these dimensions bridge service processes and patient-perceived outcomes, HEALTHQUAL is suitable for comparing service contexts in which safety, efficiency, and improvement may not be fully represented by SERVQUAL (Allahham et al., 2022; Lee, 2016; T. Sharifi et al., 2021).

Service quality in healthcare has characteristics different from other general service fields because quality is determined not only by perceptions of the service process, but also by safety and treatment outcomes. HEALTHQUAL adapts the concept of service quality to the healthcare context through five dimensions: empathy, which describes the attention and understanding of health workers; tangibles, which include physical resources, competence, and facilities; safety, which relates to the sense of security and trust in services; efficiency, which includes process accuracy, time, and resource effectiveness; and DoI, which reflects service output and improvement of condition after treatment (Allahham et al., 2022; Lee, 2016).

Empirical findings show that the contribution of each dimension can differ according to population and hospital context. In certain facilities, outcome or improvement becomes a strong determinant because patients come to obtain tangible clinical benefits; in other contexts, efficiency, safety, or physical facilities may be more prominent (Jayalie et al., 2023; Pundhiningtyas et al., 2025; Setyaningrum et al., 2024). This supports the use of HEALTHQUAL as a multidimensional instrument that needs to be tested simultaneously and also compared between service groups.

Empathy describes the ability of health workers to recognize patient conditions, listen to complaints and questions, provide clear information, and show personal attention. In maternal and child hospitals, this aspect is important because the conditions of patients and families are often accompanied by anxiety. Tangibles include the physical condition of the hospital, cleanliness, equipment, technology, comfort, and infrastructure support. In inpatient services, patients are exposed to the physical condition of the hospital for a longer duration so environmental details are more easily observed. Safety describes the sense of security, trust in health workers, infection prevention, and confidence that services are provided according to procedures. Efficiency assesses whether services are carried out effectively, are streamlined, have reasonable waiting times, and are commensurate with the costs and resources expended. DoI is the level of service improvement perceived by patients, including the suitability of treatment to needs, accuracy of therapy, and the perception that the patient's condition improves after receiving services. Conceptually, DoI is very close to outcome because the main purpose of patients coming to the hospital is to obtain improvement in health conditions (Ferreira et al., 2023; Lee, 2016; Setyaningrum et al., 2024). Patient satisfaction is a subjective evaluation after patients compare expectations with the services actually received, and is also an important indicator of service quality that can be used as a basis for quality improvement. Satisfaction can be influenced by communication, friendliness, waiting time, comfort, trust in health workers, cleanliness, room comfort, staff attitude, and perception of treatment outcomes (Bradács et al., 2025; Duc et al., 2022; Ferreira et al., 2023; Guan et al., 2024; Nemati et al., 2020; Sukmawati et al., 2024; Wang et al., 2023). Satisfaction also has managerial implications because it is related to trust, loyalty, and patient intention to return to use hospital services (Nguyen et al., 2021; Shie et al., 2022; Woo & Choi, 2021). In pediatric services, the experience of children and families is also influenced by the family-centered care approach, parental involvement, communication, and a sense of security during care (Hodgson et al., 2024; Mason et al., 2024; K. Sharifi & Kalhor, 2025). The difference in admission type is important because outpatients and inpatients undergo different service experiences and have different service contact points. Outpatient care generally takes place briefly and is more sensitive to access, clarity of flow, waiting time, and speed of pharmacy administration; efficiency and waiting time more easily become sources of

dissatisfaction because the purpose of the visit is relatively short and oriented toward completing services on the same day. Conversely, inpatients experience longer interaction with health workers and the hospital's physical environment, with longer service duration increasing patient exposure to room conditions, facilities, staff responsiveness, and treatment outcomes, so they can assess aspects of comfort, continuity, safety, and clinical outcomes more intensively. Recent studies show that hard quality and soft quality attributes can have different weights between outpatients and inpatients, so comparison based on admission type is needed so that hospitals do not assume that satisfaction-forming factors are the same for all patients (Calys-Tagoe, 2024; Chen et al., 2024; Cui et al., 2025; Marpaung & Chalidyanto, 2025; Zhang et al., 2023). Various studies show a positive relationship between service quality and patient satisfaction, including in the context of developing countries. Good service quality can increase perceived value, trust, loyalty, and intention to revisit (Nguyen et al., 2021; Shie et al., 2022; Woo & Choi, 2021). In HEALTHQUAL, DoI, efficiency, tangibles, safety, and empathy conceptually contribute to quality perception, but the magnitude of contribution is not always identical across facilities and patient segments (Nemati et al., 2020; Pundhiningtyas et al., 2025).

Although HEALTHQUAL has been used in various contexts, its application in Indonesia, especially in private maternal and child hospitals and with direct comparison between outpatient and inpatient care, is still limited. This study fills that gap through a study at RSIA Melati Husada (MH) and RSIA Melati Children Hospital (MCH), two hospitals with different main service differentiation: MH is more dominant in obstetrics and gynecology, while MCH is more dominant in pediatrics. These different characteristics allow testing whether the dimensions forming satisfaction remain consistent or change according to hospital and admission type. The study aims to identify respondent characteristics, compare outpatient and inpatient patient satisfaction, analyze the effect of HEALTHQUAL dimensions on patient satisfaction, and formulate managerial implications for improving service quality at both hospitals.

The research gap concerns whether the contribution of HEALTHQUAL dimensions remains stable when patients experience different admission pathways. Outpatients encounter a shorter sequence of registration, consultation, pharmacy, and payment, whereas inpatients experience repeated contact with clinicians, nurses, support staff, room facilities, food, cleanliness, and discharge administration. The novelty of this study therefore lies not merely in applying HEALTHQUAL, but in comparing its dimensions across two specialized private maternal-and-child hospitals and separating outpatient from inpatient models. This design links the identified gap directly to an operational contribution: hospital managers can distinguish quality priorities that are consistent across settings from those that depend on admission type and service differentiation. Based on this framework, the study tests the following hypotheses:

H1 : Service quality in general is related to patient satisfaction at RSIA Melati Husada and RSIA Melati Children Hospital.
H2 : HEALTHQUAL dimensions are simultaneously related to patient satisfaction.
H2a : Empathy is related to patient satisfaction.
H2b : Tangibles is related to patient satisfaction.
H2c : Safety is related to patient satisfaction.
H2d : Efficiency is related to patient satisfaction.
H2e : Degree of Improvement is related to patient satisfaction.

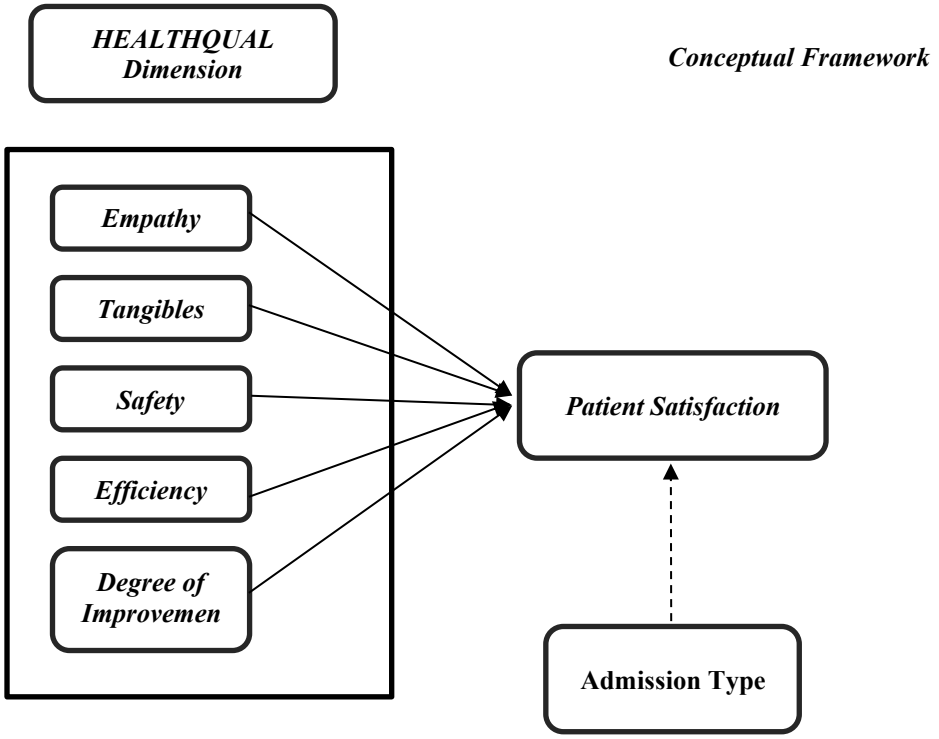


Figure 1. Conceptual Model of the Study Source: Adapted from Lee (2016) and Alkhatib & Aloqaily (2024) research design

METHOD

This study used a quantitative explanatory survey with a repeated cross-sectional design at RSIA Melati Husada and RSIA Melati Children Hospital. The hospitals are managed within the same group but differ in their dominant service profiles. The design was used to estimate associations between HEALTHQUAL dimensions and patient satisfaction and to compare those associations across outpatient and inpatient groups.

Service quality was measured using the HEALTHQUAL instrument referring to Lee (2016) and Alkhatib & Aloqaily (2024), consisting of the dimensions empathy, tangibles, safety, efficiency, and degree of improvement of care services. Patient satisfaction was measured using KKP-2017, namely a modification of the Patient Satisfaction Questionnaire Short Form (PSQ-18) in Indonesian (Astuti, 2025; Imaninda & Azwar, 2016). All questionnaires used a five-point Likert scale. The control variable was admission type. Outpatient included patients receiving polyclinic services without hospitalization, while inpatient in this study included patients with a minimum length of stay of two days.

The reliability test used Cronbach's Alpha with a threshold of >0.70, while item validity was assessed through Corrected Item Total Correlation (CITC) with a threshold of >0.30 (J. F. Hair et al., 2019; J. Hair & Sabol, 2025). Data analysis included descriptive statistics, independent-samples t-test to compare outpatient and inpatient satisfaction, and multiple linear regression to test the effect of each HEALTHQUAL dimension on patient satisfaction. Model strength was evaluated through R^2, adjusted R^2, F test, and model significance. Analysis was performed on the combined sample of each hospital and partially based on admission type using SPSS. Open comments from respondents were summarized descriptively in the categories of positive reviews, criticisms, and suggestions as reinforcement for the interpretation of quantitative results.

Sampling targeted at least 150 respondents in each admission category. Eligible outpatients had received obstetric-gynecologic or pediatric services within the previous three months. Eligible inpatients had experienced at least two days of care, were not in terminal condition, and belonged to the same service groups. Participants were 2–65 years old; pediatric questionnaires could be completed by a parent or guardian. The final sample comprised 625 respondents: 324 at MH and 301 at MCH.

Table 1
Operationalization of Research Variables

Variable/ Dimension	Measurement Focus	Scale
Empathy	Attitude, communication, personal attention	Likert 1–5
Tangibles	Facilities, equipment, comfort, competence	Likert 1–5
Safety	Environmental safety, trust, risk prevention	Likert 1–5
Efficiency	Process accuracy, time, cost, actions according to needs	Likert 1–5
Degree of Improvement	Suitability of service and improvement of patient condition	Likert 1–5
Patient satisfaction	Patient perception after receiving service	Likert 1–5

Source: Adapted from Lee (2016) and Alkhatib & Aloqaily (2024) KKP-2017.

Analysis was performed using SPSS. Reliability was assessed through Cronbach's Alpha with a threshold of >0.70 and item validity through Corrected Item Total Correlation with a threshold of >0.30. Differences in satisfaction between outpatient and inpatient were tested using independent-samples t-test. The effect of empathy, tangibles, safety, efficiency, and DoI on satisfaction was tested using multiple linear regression on the combined sample and partially according to admission type. R^2, adjusted R^2, F, model significance, beta coefficients, and p values were used to assess model strength and the relative contribution of each dimension. Open comments from respondents were grouped as supporting data to see the consistency between statistical results and patient experience.

RESULTS AND DISCUSSION

Research Results

Respondent Characteristics

The study involved 625 respondents: 324 at MH and 301 at MCH. The majority of respondents at both hospitals were aged 25–45 years. MH was dominated by obstetrics-gynecology patients, while MCH was dominated by pediatric patients. Most respondents came from Malang City, and the distribution of outpatient and inpatient groups was relatively balanced, thus supporting comparison between admission types.

Table 2
Summary of Respondent Characteristics

Characteristic	MH (n=324)	MCH (n=301)
Female	285 (88%)	183 (61%)
Age 25–45 years	270 (83%)	278 (92%)
Domicile in Malang City	165 (51%)	200 (66%)
Outpatient	163 (50%)	150 (50%)
Inpatient	161 (50%)	151 (50%)
Dominant outpatient service	Obgyn 132 (81%)	Children 143 (95%)
Dominant inpatient service	Obgyn 149 (93%)	Children 138 (91%)

Source: Authors' data analysis (2026)

Instrument Validity and Reliability

The instrument showed excellent reliability and validity. Cronbach's Alpha reached 0.983 at MH and 0.984 at MCH. All CITC values were above the 0.30 threshold, so the items were considered suitable for further analysis.

Table 3
Results of Validity and Reliability Tests

Indicator	MH	MCH	Interpretation
Number of respondents	324	301	Adequate sample
Cronbach's Alpha	0.983	0.984	Very reliable
Minimum CITC	0.491	0.591	All items valid
Maximum CITC	0.873	0.886	Very good validity

Source: Authors' data analysis (2026)

Comparison of Outpatient and Inpatient Satisfaction

Inpatient patient satisfaction was higher than outpatient satisfaction at both hospitals. The difference was significant in the independent-samples t-test with $p < 0.001$ at both MH and MCH.

Table 4

Comparison of Average Satisfaction by Admission Type

Hospital	Outpatient	Inpatient	Significance
Melati Husada	4.14	4.39	$p < 0.001$
Melati Children Hospital	4.04	4.29	$p < 0.001$

Source: Authors' data analysis (2026)

Effect of HEALTHQUAL Dimensions on Patient Satisfaction

All regression models were significant overall. In the combined MH sample, DoI, efficiency, and tangibles had significant effects, while safety and empathy were not significant. In the combined MCH sample, DoI, efficiency, tangibles, and safety were significant, while empathy was not significant. When separated by admission type, DoI remained significant in all models. Efficiency was significant in all partial models, tangibles was significant in MH outpatient as well as MH and MCH inpatient, while safety was significant in MCH inpatient. Empathy did not show a significant independent effect in all models.

Table 5

Summary of Significance of HEALTHQUAL Dimensions by Model

Dimension	Comb. MH	Comb. MCH	OP MH	OP MCH	IP MH	IP MCH
Empathy	NS	NS	NS	NS	NS	NS
Tangibles	S	SS	S	NS	SS	SS
Safety	NS	S	NS	NS	NS	SS
Efficiency	SS	SS	S	SS	SS	S
DoI	SS	SS	SS	SS	SS	SS

Note: S = significant; SS = highly significant; NS = not significant. Source: Authors' data analysis, 2026. R^2 values indicate high explanatory power of the models. The combined MH model explained 81.7% of satisfaction variation, while the combined MCH model explained 87.2%. In outpatient care, R^2 reached 80.5% at MH and 89.0% at MCH. The combined MH–MCH inpatient model produced an R^2 of 84.0%. All model F tests had $p < 0.001$, with DoI recorded as the dominant dimension in the analysis model summary.

Table 6

Summary of Regression Models

Model	R^2	Adjusted R^2	F	Sig.	Dominant Dimension
Combined MH	0.817	0.811	140.190	<0.001	DoI (β=0.652)
Combined MCH	0.872	0.867	197.177	<0.001	DoI (β=0.528)
Outpatient MH	0.805	0.799	130.003	<0.001	DoI (β=0.675)
Outpatient MCH	0.890	0.886	233.444	<0.001	DoI (β=0.604)
Inpatient MH-MCH	0.840	0.837	266.207	<0.001	DoI (β=0.391)

Source: Authors' data analysis (2026)

Regression Coefficients by Hospital and Admission Type

In the combined MH sample, DoI (β=0.480; p<0.001), efficiency (β=0.238; p<0.001), and tangibles (β=0.200; p<0.001) had significant effects, while safety and empathy were not significant. At MCH, DoI (β=0.506; p<0.001), efficiency (β=0.238; p<0.001), safety (β=0.613; p=0.004), and tangibles (β=0.098; p=0.039) had significant effects; empathy remained not significant. This pattern shows that DoI and efficiency are the most consistent at both hospitals, while the contribution of safety is more visible at MCH.

Table 7
Regression Coefficients of Outpatient and Inpatient Samples

Dimension	OP MH β (p)	OP MCH β (p)	IP MH β (p)	IP MCH β (p)
DoI	0.675 (<0.001)	0.604 (<0.001)	0.370 (<0.001)	0.377 (<0.001)
Efficiency	0.201 (0.012)	0.219 (<0.001)	0.298 (<0.001)	0.201 (0.047)
Tangibles	0.210 (0.006)	0.083 (0.234)	0.238 (<0.001)	0.164 (0.007)
Safety	-0.166 (0.132)	0.090 (0.170)	0.069 (0.365)	0.313 (<0.001)
Empathy	0.022 (0.722)	0.001 (0.985)	0.012 (0.824)	-0.132 (0.630)

Source: Authors' data analysis (2026)

In outpatient care, DoI and efficiency were significant at both MH and MCH, while tangibles was significant only at MH. Safety and empathy were not significant at either hospital. In inpatient care, DoI, efficiency, and tangibles were significant at both MH and MCH; safety was significant at MCH but not at MH, while empathy remained not significant. Hospital type also affected outpatient satisfaction (p=0.001), but did not significantly affect inpatient satisfaction (p=0.060). This finding shows that the pattern of satisfaction formation becomes more heterogeneous when the analysis is separated by admission type.

Summary of Respondent Open Comments

Open comments reinforced the quantitative pattern. Of positive reviews, the DoI category dominated at MH with 77% and at MCH with 68%, while empathy accounted for 10% and 16%, and tangibles for 13% and 16%, respectively. Conversely, suggestions, criticisms, and input were mostly related to tangibles, namely 58% at MH and 56% at MCH. This finding shows that patients broadly appreciate the benefits and quality of service, but still identify facilities and the physical environment as the main areas for improvement.

Table 8
Summary of Respondent Qualitative Data

Type of Finding	MH	MCH	Main Pattern
Positive reviews	176 (70%)	258 (74%)	DoI dominant: MH 77%; MCH 68%
Criticisms/suggestions/input	76 (30%)	89 (26%)	Tangibles dominant: MH 58%; MCH 56%

Source: Authors' data analysis (2026)

Positive reviews largely described good service, friendly and informative staff, comfortable hospitals, and improvement of patient conditions. Conversely, suggestions and criticisms were more directed at facilities and service processes, such as waiting rooms, parking, breastfeeding room privacy, separation of sick and healthy children's areas, pharmacy duration, registration, discharge administration, and the need for supporting facilities. This pattern reinforces that perceived service outcomes and the physical-service experience should be interpreted together when determining quality-improvement priorities.

Discussion

Respondent Characteristics and Service Context

The majority of respondents were in the 25–45-year working-age range (83% at MH and 92% at MCH). At MH, female respondents reached 88% and services were dominated by obstetrics-gynecology, while MCH served more pediatrics. Respondent domicile was mainly from Malang City and Malang Regency. This composition is in accordance with the character of both RSIAs and shows that patient experience cannot be separated from the specific needs of pregnant mothers, children, and accompanying families.

Differences in service focus also explain why several HEALTHQUAL dimensions show unequal patterns. MH has a long-known maternity service base, so trust in clinical and safety aspects can be formed before patients arrive. MCH focuses on child services, so parents can give higher attention to safety, child comfort, communication, and treatment success. Thus, the

hospital differences in this study are not only differences in location, but also differences in service differentiation and the experience received by patients.

Differences in Outpatient and Inpatient Satisfaction

The results show that inpatient satisfaction was consistently higher than outpatient satisfaction at both hospitals. This finding can be understood from the differences in the characteristics of the service experience. Inpatients have longer interaction time with doctors, nurses, pharmacy, laboratory, nutrition, and supporting staff so there are more opportunities to experience staff responsiveness, comfort, and continuity of care. Patients are also exposed longer to treatment rooms and physical facilities. Research by Chen et al. (2024) shows that inpatients are more sensitive to hard quality such as infrastructure, equipment, and comfort, while outpatients are more exposed to short processes that make waiting time and service speed very important. Other findings also show differences in satisfaction levels between outpatient and inpatient because the intensity of interaction and service characteristics are not the same (Calys-Tagoe, 2024; Cui et al., 2025).

In outpatient services, delays in registration, waiting for the doctor, pharmacy queues, or payment can reduce the assessment of the overall experience even though clinical quality is considered good. The effect of waiting time on outpatient satisfaction has been shown in previous empirical research (Zhang et al., 2023). Thus, improving outpatient satisfaction requires stronger intervention in the flow and speed of the process, while in inpatient care the quality of experience must be maintained comprehensively while the patient is in the hospital.

DoI as the Most Consistent Dimension

DoI is the most consistent finding in all models. This dimension reflects service suitability, treatment accuracy, and patient perception of condition improvement after service. The position of DoI as the main determinant is in line with the concept of outcome in the service quality framework: patients ultimately assess whether the service provides real benefits to their health condition. Studies based on HEALTHQUAL and the Donabedian framework support the importance of improvement or outcome in forming satisfaction (Allahham et al., 2022; Pundhiningtyas et al., 2025; Setyaningrum et al., 2024). Ferreira et al. (2023) also place the health status perceived by patients as one of the determining factors of satisfaction.

The maternal and child context strengthens the meaning of DoI. In pediatric services, improvement of the child's condition can reduce parents' anxiety and form a positive evaluation of the hospital. Literature on pediatric experience shows that rapid response, treatment success, communication, and family involvement influence the experience of patients and caregivers (Hodgson et al., 2024; K. Sharifi & Kalhor, 2025). The dominance of DoI in positive comments (77% at MH and 68% at MCH) also shows consistency between regression results and experiences conveyed directly by respondents.

In the outcome framework, DoI can be understood as the real benefit received by patients after the service process. Patients come with the main goal of obtaining an accurate diagnosis, appropriate treatment, reduced symptoms, or improved condition. Therefore, although facility and staff interaction factors are important, the service experience will be difficult to assess as very satisfying if the treatment outcome is not perceived as providing improvement. These findings are in line with literature that places perceived health status and improvement as important determinants of satisfaction (Allahham et al., 2022; Ferreira et al., 2023).

Efficiency, Tangibles, and Safety

Efficiency became the second most consistent dimension. Efficiency reflects whether patients obtain services that are appropriate, fast, streamlined, and commensurate with the time or cost expended. Its significance in outpatient and inpatient care shows that patient experience of the service process remains important throughout the service episode. In outpatient care, efficiency is closely related to registration, waiting time, doctor examination, medication service, and payment. Literature shows that efficient administration and better waiting times contribute to patient satisfaction (Jayalie et al., 2023; Marpaung & Chalidyanto, 2025) Zhang et al., 2023).

Tangibles was significant in the combined MH model, combined MCH, outpatient MH, and

inpatient MH and MCH. This finding is consistent with the character of a hospital that emphasizes patient comfort and the physical environment as part of the patient experience. Room comfort, cleanliness, signage, lighting, and supporting facilities can shape perceptions of quality, especially for patients who stay longer in the hospital (Chen et al., 2024; Kusumaningrum, 2017). The criticism most frequently expressed by respondents at both hospitals related to tangibles reinforces that the physical area is a priority for improvement even though many overall reviews were positive. A similar pattern is found in studies of patient experience that highlight facilities, space, comfort, and the environment as recurring improvement themes (Brookes & Baker, 2023; Lau et al., 2026; Mason et al., 2024).

Safety showed a more contextual pattern. This dimension was significant at MCH, especially in inpatient care, but not significant at MH. In a children's hospital, safety can be more noticed by parents during inpatient care because they directly observe medication administration, procedures, monitoring, and interaction of health workers over a long duration. A sense of safety is also related to trust in facilities and health workers (Guan et al., 2024; Wang et al., 2023). At MH, which has a long reputation as a maternity hospital, safety may have been perceived as an attribute that is already expected to be fulfilled, so the variation in assessment between patients is smaller.

Efficiency has a very practical meaning for patients. In outpatient care, patients expect a fast flow from registration to obtaining care. Long waiting times can reduce the experience even though the doctor's clinical quality is considered good. In inpatient care, efficiency is seen in the speed of nurse response, accuracy of supporting examinations, coordination between units, and the discharge administration process. The finding that efficiency is consistently significant supports research showing the relationship between waiting time and administrative processes and patient satisfaction (Marpaung & Chalidyanto, 2025; Zhang et al., 2023).

Tangibles also has a large role, especially because the service concept of both hospitals emphasizes comfort and patient experience. Inpatients stay longer so it is easier to assess room cleanliness, beds, lighting, noise, toilets, and supporting facilities. At MCH, a child-friendly environment can reduce fear and help families feel more comfortable. The qualitative criticism pattern dominated by tangibles shows that physical aspects remain the area most easily identified by patients when there is a mismatch with expectations (Chen et al., 2024; Mason et al., 2024).

Safety is more contextual. The non-significance of safety at MH may reflect that safety has been perceived as a basic standard that must indeed be available in a hospital with a strong maternity reputation. Conversely, safety was significant at MCH, especially inpatient, because parents observe the child's treatment process over a longer time, from medication administration, procedures, observation, to the response of health workers. Family involvement and clear communication can strengthen the sense of security as well as trust in child services (Guan et al., 2024; Hodgson et al., 2024).

Empathy, Ceiling Effect, and Shared Variance

Empathy did not show a significant independent effect in all models, but this result does not mean empathy is not important. The average empathy score was actually high, namely 4.54 at MH and 4.30 at MCH. A total of 42.59% of MH respondents and 22.92% of MCH respondents gave maximum scores on all empathy indicators; in addition, 91.67% of MH respondents and 97.01% of MCH respondents gave scores of 4 or 5 on all indicators. This highly concentrated distribution on high scores indicates restricted variance and ceiling effect so that the ability of the variable to differentiate satisfaction levels becomes lower.

Ceiling effects have also been reported in patient-reported experience measurements, including communication and perceived empathy (Badejo et al., 2022; Brinkman et al., 2025). Therefore, the non-significance of empathy in regression must be read together with descriptive results and relationships between dimensions. The analysis also showed high VIF on safety and other dimensions, indicating shared variance and multicollinearity. Under such conditions, individual coefficients can shrink even though bivariately a dimension remains strongly related to satisfaction. Evidence from a systematic review shows that empathy can still increase patient satisfaction, but the magnitude of its effect depends on the population, instrument, and analysis model (Keshtkar et al., 2024). Thus, hospitals should not reduce the priority of empathy merely

because the individual regression p-value is not significant.

Integration of Quantitative and Qualitative Findings

Qualitative data provide reinforcement for the regression results. Positive reviews were dominated by DoI (77% at MH and 68% at MCH), which shows that patients spontaneously assess quality largely through service quality and perceived benefits. Conversely, criticisms and suggestions were mostly related to tangibles (58% at MH and 56% at MCH). This finding shows that patients can be very satisfied with service outcomes but still have high expectations regarding facilities, comfort, access, and service processes.

Theoretical, Methodological, and Managerial Implications

Theoretically, the study reinforces that service quality in HEALTHQUAL is a multidimensional construct. Each dimension contributes differently, and these contributions are heterogeneous across hospital context and admission type. DoI and efficiency are the most consistent dimensions, while tangibles and safety change according to service characteristics. The finding on empathy shows the importance of assessing statistical significance together with score distribution, ceiling effect, and multicollinearity, not only based on individual p-values.

Because the study used two hospitals within one management context and several HEALTHQUAL dimensions were strongly correlated, the regression coefficients should be interpreted as context-specific adjusted associations rather than universal rankings of dimension importance. The findings are therefore most useful for service-priority decisions within comparable maternal-and-child hospital settings.

Managerially, the main priority for both MH and MCH is maintaining service outcomes through consistency of clinical pathways, clinical practice guidelines, standard operating procedures, and outcome evaluation. The next priority is process efficiency, especially registration, doctor waiting time, pharmacy, discharge administration, and payment. Tangibles need to be improved through maintenance and development of facilities according to the needs of mothers and children. Safety and empathy must still be maintained as the foundation of service, especially for child patients and families who are sensitive to communication, a sense of security, and involvement in the care process. This consistency can strengthen the small specialized hospital concept that places clinical outcomes, comfort, and patient experience as part of the service proposition.

Methodologically, the high R^2 values indicate that HEALTHQUAL has strong explanatory value for satisfaction, but the high relationship between dimensions also needs to be examined. In this study there was shared variance and indications of multicollinearity, especially on safety and empathy. Therefore, individual regression coefficients should not be read based only on p-values without looking at descriptive, correlation, and service context. Future research can use SEM or PLS-SEM to test relationships between dimensions, mediation, or moderation more comprehensively.

CONCLUSION

Service quality is a fundamental factor forming patient satisfaction at RSIA Melati Husada and RSIA Melati Children Hospital. Inpatient patients have significantly higher satisfaction than outpatient patients at both hospitals. Overall, all service quality models were significant and had high explanatory values. DoI is the most consistent dimension, followed mainly by efficiency and tangibles. Safety contributes contextually, especially at MCH and inpatient services, while empathy does not show a significant independent effect even though it is rated highly descriptively.

These findings indicate that quality improvement strategies should prioritize service outcomes perceived by patients, process efficiency, and physical facilities, without reducing attention to safety and the quality of interpersonal interaction. Open comments support this direction: positive reviews mainly emphasize service improvement, while criticisms mostly relate to tangible aspects.

More specifically, the difference in hospital type significantly affects outpatient satisfaction (p=0.001), but does not significantly affect inpatient satisfaction (p=0.060). This finding

reinforces that the outpatient experience is more sensitive to hospital characteristics, service differentiation, and the relatively short visit flow. In inpatient care, the experience lasts longer and involves more service contact points so satisfaction is more formed by a combination of outcome, efficiency, facilities, and safety. Therefore, quality improvement strategies need to be differentiated by admission type, while still maintaining consistent service standards at both hospitals.

The main limitation of the study is that its coverage includes only two private type C hospitals in Malang City with adjacent managerial contexts and different service differentiation. Generalization to general hospitals, government hospitals, or other regions must be done carefully. In addition, the ceiling effect on empathy and shared variance among HEALTHQUAL dimensions can reduce the ability of the model to distinguish the independent contribution of each dimension. Future research is recommended to involve hospitals with more diverse characteristics and management, use SEM or PLS-SEM to test relationships between dimensions, and add moderation analysis according to admission type or patient characteristics. Qualitative data can also be developed through interviews or focus group discussions so that patient experiences not captured in quantitative scales can be explained in greater depth.

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AUTHOR CONTRIBUTION STATEMENT

Yusufa Ibnu Sina Setiawan contributed to the conceptualization of the research, data collection and analysis, and writing of the initial manuscript; Hastuti Naibaho contributed to supervision, methodology, and review and editing of the final manuscript. All authors have read and approved the final published manuscript.

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