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Examining SERVQUAL Dimensions and Patient Satisfaction Using PLS-SEM: Evidence From an Indonesian Public Health Center

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Abstract: Primary healthcare centers in Indonesia face persistent service quality challenges, yet empirical studies employing structural modeling in resource-constrained settings remain scarce. This study analyzes the effect of the five SERVQUAL dimensions—tangibles, reliability, responsiveness, assurance, and empathy—on patient satisfaction at Keboan Ngusikan Public Health Center, Jombang Regency, East Java. Using a quantitative cross-sectional design, 300 outpatients were selected via purposive sampling and surveyed with a validated Likert-scale instrument. Partial Least Squares–Structural Equation Modeling (PLS-SEM) was applied for analysis. All five dimensions exerted a positive and statistically significant effect on patient satisfaction. Responsiveness emerged as the most influential predictor, followed by tangibles, assurance, empathy, and reliability. The model demonstrated strong explanatory power ($R^2 = 0.712$), explaining 71.2% of variance in patient satisfaction. These findings extend Service Quality Theory to a primary care context with staffing constraints, offering actionable implications for healthcare managers and policymakers seeking to improve service delivery at community health centers across Indonesia.

Keywords: SERVQUAL, Patient Satisfaction, Public Health Center, Indonesia

INTRODUCTION

Healthcare service quality has emerged as a central concern in global health system performance, particularly at the primary care level where most patient-provider interactions occur. In Indonesia, public health centers (Puskesmas) constitute the foundation of the national primary healthcare system, serving as the first point of contact for millions of citizens seeking medical assistance. These facilities are expected to deliver services that are prompt, accurate, technically competent, and patient-centered. However, ongoing structural challenges including understaffing, infrastructure gaps, and inconsistent service standards continue to impede the delivery of high-quality care (Jumaidi, 2025).

Patient satisfaction is widely recognized as a critical outcome indicator and a proxy measure of service quality in healthcare settings. High satisfaction rates are associated with improved treatment adherence, greater willingness to recommend facilities, and enhanced institutional trust (Laila, 2024). Conversely, dissatisfaction generates negative perceptions, reduces care-seeking behavior, and erodes public confidence in health institutions (Hattab &

Salingkat, 2024). As Indonesia pursues universal health coverage under the Jaminan Kesehatan Nasional (JKN) program, ensuring acceptable service quality at Puskesmas has become a strategic policy imperative (Sirajuddin et al., 2026).

Keboan Ngusikan Public Health Center, located in Jombang Regency, East Java, exemplifies these systemic challenges. Of the 100 required personnel, only 72 are currently employed, with pronounced shortfalls in nursing and midwifery. Despite a community satisfaction index of 91.06 (classified as very good), structured patient feedback reveals recurring complaints in three domains: (1) fee and service cost transparency; (2) physical facility cleanliness, particularly restrooms; and (3) service punctuality, especially in laboratory turnaround times (RUK, 2025). This divergence between aggregate satisfaction scores and specific service complaints suggests that average indices may mask dimension-level deficiencies, underlining the need for a more granular diagnostic approach.

Research on SERVQUAL and patient satisfaction in Indonesian Puskesmas has grown steadily; however, several gaps remain. First, most studies focus on urban or fully staffed facilities, leaving resource-constrained rural settings underexplored (Minarti et al., 2024; Runggandini, 2024). Second, few studies employ PLS-SEM, which is better suited than regression for simultaneously estimating multiple latent constructs and testing complex causal structures (Hair et al., 2021). Third, the relative influence of individual SERVQUAL dimensions rather than aggregate service quality on patient satisfaction at primary health centers is rarely examined, limiting actionable guidance for facility-level management. Addressing these gaps, this study investigates: (1) whether each SERVQUAL dimension significantly affects patient satisfaction at Keboan Ngusikan Public Health Center; and (2) which dimension exerts the greatest influence.

The findings are expected to contribute theoretically by extending Service Quality Theory to a primary care context characterized by staffing constraints, and practically by providing evidence-based recommendations for improving specific service dimensions at community health centers across Indonesia.

The theoretical foundation of this study rests on Service Quality Theory, as developed by Parasuraman, Zeithaml, and Berry (1985, 1988). Their foundational work conceptualized service quality as the gap between customers' expectations of a service and their perceptions of actual service performance formalized as the SERVQUAL model. The framework posits that when perceived service meets or exceeds expectations, quality is satisfactory; when it falls below expectations, a quality gap exists. Zeithaml et al. (1990) further argued that service quality is an antecedent to customer satisfaction, meaning improvements in service quality systematically produce higher satisfaction levels. This theoretical proposition has been empirically supported across diverse service contexts, including healthcare (Chandra et al., 2020; Nashar, 2020).

The SERVQUAL instrument operationalizes service quality through five dimensions: (1) Tangibles the appearance of physical facilities, equipment, and staff; (2) Reliability the ability to perform the promised service dependably and accurately; (3) Responsiveness willingness to help customers and provide prompt service; (4) Assurance the knowledge, courtesy, and trustworthiness of employees; and (5) Empathy individualized attention and care provided to customers (Parasuraman et al., 1988). These dimensions remain the dominant framework in healthcare service quality research (Sellang et al., 2022; Putri, 2022).

Patient satisfaction is defined as a subjective evaluative judgment of healthcare service quality based on the comparison between a patient's expectations and their perceived service experience (Candrianto, 2021). Aryawan ATD (2021) frames satisfaction as a post-consumption affective response: when perceived performance meets or exceeds expectations, satisfaction occurs; when it falls short, dissatisfaction results. According to Putri (2022), satisfaction is further shaped by the perceived value of the service, the emotional state during the encounter, and confidence in the chosen facility. In healthcare, patient satisfaction has been operationalized around three core factors: (1) fulfillment of clinical and interpersonal

expectations; (2) quality of the immediate service experience (environment, staff behavior, waiting time); and (3) perceived appropriateness of the facility choice (Chandra et al., 2020).

Relationship Between SERVQUAL Dimensions and Patient Satisfaction

The empirical literature consistently demonstrates positive associations between SERVQUAL dimensions and patient satisfaction. Minarti et al. (2024) found that all five dimensions positively and significantly predicted patient satisfaction at Batu-Batu Public Health Center using PLS-SEM. Febrianti (2023) identified assurance and empathy as the most significant predictors in a mental health outpatient unit. Hidayatullah (2024) confirmed a significant effect of tangibles on BPJS patient satisfaction. Transyah et al. (2025) reported a significant relationship between tangibles and inpatient satisfaction. Ameliah et al. (2023) found responsiveness to be a key predictor in a rural Puskesmas. Runggandini (2024) confirmed a positive effect of overall service quality on outpatient satisfaction through a literature review synthesis.

Collectively, this body of evidence supports the following hypotheses:

H1: Tangibles have a positive and significant effect on patient satisfaction.
H2: Reliability has a positive and significant effect on patient satisfaction.
H3: Responsiveness has a positive and significant effect on patient satisfaction.
H4: Assurance has a positive and significant effect on patient satisfaction.
H5: Empathy has a positive and significant effect on patient satisfaction.

METHOD

This study employed a quantitative descriptive approach with a causal-associative, cross-sectional design. Data were collected in January 2026 at Keboan Ngusikan Public Health Center, Jombang Regency, East Java, Indonesia. This facility was purposively selected due to its documented staffing shortfalls and the availability of community satisfaction survey data enabling triangulation with primary findings.

The target population comprised all outpatients who received services at Keboan Ngusikan Public Health Center during the study period. Purposive sampling was applied with three inclusion criteria: (1) patients who had visited the facility on more than one occasion; (2) patients aged 18 years or older; and (3) patients who provided informed consent to participate. Sample size was determined following Hair et al. (2021), who recommend a minimum of ten observations per indicator for PLS-SEM; with 30 indicators in the model, 300 respondents were required and obtained.

Data were collected using a structured, self-administered questionnaire employing a five-point Likert scale (1 = Strongly Disagree to 5 = Strongly Agree). The instrument comprised 30 items: 25 items measuring the five SERVQUAL dimensions (five items each) and five items measuring patient satisfaction. All items were adapted from Febrianti (2023) and Anggit & Setyorini (2022). The complete operationalization of variables is presented in Table 1.

Table 1. Operational Variables, Indicators and Measurement Scale

Variable	Code	Indicator Description	Scale	Source
Tangibles	T1	Physical appearance of staff and facilities	Likert 1–5	Febrianti (2023)
	T2	Comfort and neatness of the service area	Likert 1–5	
	T3	Discipline and tidiness of staff appearance	Likert 1–5	
	T4	Availability and proper use of medical equipment	Likert 1–5	
	T5	Completeness and availability of service units	Likert 1–5	
Reliability	R1	Accuracy and precision in delivering services	Likert 1–5	Anggit & Setyorini (2022)
	R2	Adherence to established service standards	Likert 1–5	
	R3	Proper and appropriate use of tools during service	Likert 1–5	
	R4	Consistency between commitments and actual service	Likert 1–5	
	R5	Clarity and accuracy of service information provided	Likert 1–5	
Responsiveness	RP1	Speed and promptness in responding to patient needs	Likert 1–5	Febrianti (2023)
	RP2	Accuracy of actions taken in response to patient requests	Likert 1–5	

	RP3	Thoroughness and completeness in service delivery	Likert 1–5	
	RP4	Proactive assistance offered to patients without being asked	Likert 1–5	
	RP5	Ability to accommodate and fulfill diverse patient needs	Likert 1–5	
Assurance	A1	Transparency regarding service time schedules	Likert 1–5	Febrianti (2023)
	A2	Transparency and clarity of service cost information	Likert 1–5	
	A3	Adequate protection of patient rights during service	Likert 1–5	
	A4	Assurance of patient safety throughout the service process	Likert 1–5	
	A5	Staff knowledge, competence, and professional conduct	Likert 1–5	
Empathy	E1	Friendliness and warmth of staff toward patients	Likert 1–5	Anggit & Setyorini (2022)
	E2	Courtesy and respectful communication by staff	Likert 1–5	
	E3	Non-discriminatory and equal treatment of all patients	Likert 1–5	
	E4	Genuine respect and attentiveness to patient concerns	Likert 1–5	
	E5	Personalized and individualized attention to each patient	Likert 1–5	
Patient Satisfaction	KP1	Fulfillment of patient expectations by the service received	Likert 1–5	Febrianti (2023)
	KP2	Satisfaction with the outcomes of treatment decisions	Likert 1–5	
	KP3	Confidence in the choice of this health facility	Likert 1–5	
	KP4	Overall satisfaction with the quality of services received	Likert 1–5	
	KP5	Willingness to recommend this facility to others	Likert 1–5	

Source: Adapted from Febrianti (2023); Anggit & Setyorini (2022)

Data Analysis

Partial Least Squares–Structural Equation Modeling (PLS-SEM) using SmartPLS 4.0 was employed for data analysis. PLS-SEM was preferred over covariance-based SEM for three reasons: it does not require multivariate normality, it performs robustly with medium-sized samples, and it is suited to exploratory, prediction-oriented research (Hair et al., 2021). Model assessment followed a two-stage process. The outer model was evaluated for: (1) convergent validity (outer loadings > 0.70; Average Variance Extracted [AVE] ≥ 0.50); (2) discriminant validity (Heterotrait–Monotrait Ratio [HTMT] < 0.90); and (3) construct reliability (Composite Reliability [CR] > 0.70; Cronbach's Alpha [α] > 0.60). Multicollinearity was assessed using the Variance Inflation Factor (VIF < 5.0). The inner model was evaluated using the coefficient of determination (R^2), predictive relevance (Q^2), effect sizes (f^2), and path coefficients. Hypothesis testing was conducted via bootstrapping (5,000 resamples), with t-statistic > 1.96 and p-value < 0.05 as the acceptance threshold.

RESULTS AND DISCUSSION

Respondent Profile

A total of 300 respondents participated in the study, all of whom provided complete and usable responses. In terms of gender, males constituted the majority (58.7%, n = 176), with females accounting for 41.3% (n = 124). The largest age group was 26–33 years (47.0%, n = 141), followed by 18–25 years (28.7%, n = 86), 34–40 years (15.0%, n = 45), 41–50 years (8.0%, n = 24), and over 50 years (1.3%, n = 4). Regarding occupation, self-employed individuals were most prevalent (33.7%, n = 101), followed by private sector employees (26.0%, n = 78), students (25.7%, n = 77), and homemakers (14.7%, n = 44). Educational attainment was predominantly at the bachelor's degree level (56.0%, n = 168), followed by senior high school graduates (40.0%, n = 120) and elementary or junior high school graduates (4.0%, n = 12). The dominance of working-age respondents with tertiary education suggests a sample capable of providing informed and nuanced evaluations of service quality.

Outer Model Assessment

Table 2. Outer Loadings

Construct	Indicator	Loading	AVE	CR	α

Tangibles	T1, T2, T3, T4, T5	0.829–0.900	0.764	0.942	0.923
Reliability	R1, R2, R3, R4, R5	0.812–0.893	0.732	0.932	0.908
Responsiveness	RP1, RP2, RP3, RP4, RP5	0.820–0.896	0.739	0.934	0.912
Assurance	A1, A2, A3, A4, A5	0.833–0.903	0.768	0.943	0.924
Empathy	E1, E2, E3, E4, E5	0.825–0.895	0.749	0.937	0.916
Patient Satisfaction	KP1, KP2, KP3, KP4, KP5	0.796–0.872	0.682	0.915	0.883

Note: All loadings > 0.70; AVE ≥ 0.50; CR > 0.70; α > 0.60. Source: SmartPLS output, processed (2026)

Table 3. Discriminant Validity (HTMT) and Multicollinearity (VIF)

Construct	TAN	REL	RES	ASS	EMP	SAT	VIF
Tangibles	—						2.341
Reliability	0.821	—					2.108
Responsiveness	0.813	0.806	—				2.276
Assurance	0.815	0.828	0.819	—			2.390
Empathy	0.816	0.812	0.808	0.823	—		2.198
Patient Satisfaction	0.807	0.794	0.812	0.809	0.798	—	—

Note: All HTMT values < 0.90 (discriminant validity confirmed); all VIF < 5.0 (no multicollinearity). Source: SmartPLS output, processed (2026)

All indicator outer loadings exceeded the 0.70 threshold, and all AVE values were above 0.50, confirming convergent validity. HTMT ratios across all construct pairs were below 0.90, establishing discriminant validity. Composite Reliability and Cronbach's Alpha values for all constructs exceeded 0.70 and 0.60, respectively, confirming internal consistency. All inner VIF values were below 5.0, indicating no problematic multicollinearity among the predictors.

Inner Model Assessment

Table 4. Inner Model Fit and Predictive Relevance

Parameter	Value	Criterion	f^2	Interpretation
R^2 (Patient Satisfaction)	0.712	> 0.67	—	Substantial
Q^2 (Blindfolding)	0.479	> 0	—	Strong predictive relevance
GoF Index	0.725	> 0.36	—	Large model fit
Tangibles → Sat.	—	—	0.148	Medium effect
Reliability → Sat.	—	—	0.112	Small-medium effect
Responsiveness → Sat.	—	—	0.163	Medium effect (largest)
Assurance → Sat.	—	—	0.135	Medium effect
Empathy → Sat.	—	—	0.121	Small-medium effect

Note: f^2 benchmarks: 0.02 = small, 0.15 = medium, 0.35 = large (Cohen, 1988). Source: SmartPLS output, processed (2026)

The R^2 value of 0.712 indicates that the five SERVQUAL dimensions collectively account for 71.2% of the variance in patient satisfaction, exceeding Hair et al.'s (2021) threshold of 0.67 for a substantial model. The Q^2 value of 0.479 confirms strong predictive relevance. The GoF of 0.725 indicates large overall model fit. Effect sizes (f^2) ranged from small-to-medium (reliability, empathy) to medium (tangibles, assurance, responsiveness), with responsiveness yielding the largest f^2 (0.163).

Hypothesis Testing

Table 5. Path Coefficients and Hypothesis Testing Results

H	Path	β	t-stat	p-value	95% CI	Decision
H1	Tangibles → Patient Satisfaction	0.241	4.055	0.000	[0.124, 0.358]	Supported
H2	Reliability → Patient Satisfaction	0.189	4.994	0.000	[0.115, 0.263]	Supported
H3	Responsiveness → Patient Satisfaction	0.262	2.528	0.012	[0.058, 0.466]	Supported (strongest)

H4	Assurance → Patient Satisfaction	0.218	3.470	0.001	[0.093, 0.343]	Supported
H5	Empathy → Patient Satisfaction	0.198	2.838	0.005	[0.060, 0.336]	Supported

Note: Bootstrapping with 5,000 resamples. β = standardized path coefficient. Source: SmartPLS output, processed (2026)

All five hypotheses were supported at $p < 0.05$, confirming that each SERVQUAL dimension positively and significantly predicted patient satisfaction. Responsiveness had the largest path coefficient (β = 0.262), followed by tangibles (β = 0.241), assurance (β = 0.218), empathy (β = 0.198), and reliability (β = 0.189).

Discussion

The finding that all five SERVQUAL dimensions significantly predict patient satisfaction is consistent with the theoretical proposition of Parasuraman et al. (1988) and with empirical evidence from Indonesian primary care settings (Minarti et al., 2024; Runggandini, 2024). However, the present study extends this literature in two important ways: it applies PLS-SEM to simultaneously estimate all five paths, and it contextualizes results within a facility experiencing documented resource constraints, enabling more policy-relevant interpretation.

Responsiveness emerged as the dominant predictor (β = 0.262). This can be explained through several interlocking mechanisms. First, at the operational level, Keboan Ngusikan's staffing deficit of 28% creates structural bottlenecks that directly elongate waiting times particularly in laboratory services making responsiveness more salient than it would be in fully staffed facilities. Second, at the psychological level, research in queuing psychology shows that perceived waiting time is disproportionately amplified when patients feel ignored rather than acknowledged (Minarti et al., 2024). Third, from a patient expectation standpoint, community health center users many of whom are insured under JKN often hold calibrated, rather than elevated, service expectations; in this context, staff promptness and attentiveness carry outsized symbolic value as signals of institutional care (Sirajuddin et al., 2026). These findings align with Hidayatullah (2024) and Ameliah et al. (2023), both of whom found responsiveness to be a strong predictor in resource-limited public health settings.

Tangibles ranked second (β = 0.241). Despite the aggregate satisfaction index of 91.06, patient complaints regarding restroom cleanliness and facility comfort indicate that physical environment quality has not reached a level that patients regard as satisfactory. This aligns with Transyah et al. (2025), who found that tangibles significantly influenced inpatient satisfaction, and with the broader literature suggesting that physical environments function as heuristic cues for overall service quality, particularly for patients who lack the clinical expertise to evaluate technical care quality directly (Zeithaml et al., 1990).

Assurance (β = 0.218) had a significant positive effect, consistent with Ameliah et al. (2023) and Khatimah et al. (2024). However, its effect was somewhat smaller than responsiveness and tangibles. This may reflect the relatively high perceived clinical competence of staff, which raises the baseline expectation for assurance and reduces the marginal satisfaction return of incremental improvements in this dimension. Empathy (β = 0.198) was positively significant, replicating findings by Kurniawan et al. (2022) and Minarti et al. (2024), who identified staff interpersonal warmth as a consistent predictor of satisfaction across Indonesian health settings. Reliability (β = 0.189) had the smallest but still significant effect. Patients at this facility appear to regard technical service consistency as adequate, meaning this dimension is unlikely to drive significant satisfaction gains absent more visible interpersonal improvements a pattern also noted by Febrianti (2023).

From a theoretical standpoint, these results support the applicability of Service Quality Theory (Parasuraman et al., 1988; Zeithaml et al., 1990) in primary care settings with limited resources, demonstrating that the SERVQUAL satisfaction linkage holds across different staffing contexts. The differential weighting of dimensions, however, suggests that the theory's

practical implications are context-sensitive: resource-constrained facilities should prioritize responsiveness and tangibles, as these dimensions carry the greatest leverage for satisfaction improvement under structural constraints.

CONCLUSION

This study demonstrated that all five SERVQUAL dimensions—tangibles, reliability, responsiveness, assurance, and empathy—exerted positive and significant effects on patient satisfaction at Keboan Ngusikan Public Health Center, with the model explaining 71.2% of outcome variance ($R^2 = 0.712$). Responsiveness was the strongest predictor ($\beta = 0.262$), driven by structural staffing constraints that magnify the salience of prompt and attentive service. Tangibles ranked second ($\beta = 0.241$), reflecting the importance of the physical service environment as a quality signal. These findings extend Service Quality Theory to a resource-constrained primary care context and confirm the robustness of the PLS-SEM approach for modeling complex service quality structures.

Practical implications are threefold. In the short term, facility management should prioritize workflow redesign to reduce waiting times, particularly in laboratory services, and ensure consistent proactive communication with waiting patients. In the medium term, systematic improvements to physical facility maintenance including restroom cleanliness protocols and waiting room comfort—should be implemented and monitored through patient feedback mechanisms. In the long term, structured training in interpersonal communication, empathy, and clinical transparency should be institutionalized as part of staff development programs.

This study has several limitations that inform future research directions. First, data were collected at a single facility during one month; multi-site longitudinal studies would enhance generalizability. Second, purposive sampling limits external validity. Third, this study did not examine mediating mechanisms (e.g., patient trust) or moderators (e.g., insurance type, visit frequency) that may condition the SERVQUAL–satisfaction relationship. Future research should incorporate patient loyalty and trust as additional outcome variables and conduct comparative analyses across Puskesmas with varying resource capacities to deepen understanding of context-specific service quality drivers.

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