Mediating Role of Patient Satisfaction in the Relationship Between Service Quality and the Performance of Private Hospitals in Keffi

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Abstract

Service quality is now a key benchmark for hospital success globally, especially in private healthcare where patient expectations continue to grow. In Nigeria, the push for better healthcare delivery has increased interest in the link between service quality, patient satisfaction, and hospital performance. This study examines how patient satisfaction mediates the relationship between service quality and the performance of private hospitals in Keffi. The research is based on the SERVQUAL Model and Expectancy-Disconfirmation Theory (EDT), offering a strong foundation to understand how perceived service quality affects outcomes via patient satisfaction. A quantitative design was used, with data collected from 250 patients and 100 healthcare professionals using a structured 5-point Likert scale questionnaire. Key service quality dimensions studied included trust, responsiveness, treatment effectiveness, and post-care follow-up. Hospital performance was measured through financial stability, medical accuracy, staff competence, and patient retention. Data were analysed using Smart PLS-SEM with thorough pre- and post-estimation diagnostics to ensure reliability and validity. These included Cronbach's Alpha (0.91), Composite Reliability (0.94), Average Variance Extracted (0.78), and VIF (2.89), all within acceptable levels. Structural model analysis showed that service quality significantly impacted both patient satisfaction ($\beta = 0.567$, $p < 0.001$) and hospital performance ($\beta = 0.412$, $p < 0.001$). Patient satisfaction also had a strong effect on performance ($\beta = 0.498$, $p < 0.001$). Mediation analysis revealed that patient satisfaction partially mediated the link between service quality and hospital performance, with a variance accounted for (VAF) of 40.6%. The study recommends that hospital managers prioritise service quality to improve both patient satisfaction and institutional performance, providing useful insights for healthcare policymakers in Nigeria.

Keywords: *Patient satisfaction, Service quality and Hospital performance*

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Background to the Study

Service quality has become a fundamental determinant of healthcare performance across the globe, as hospitals strive to meet patient expectations while ensuring operational efficiency. In developed economies, service quality is often enhanced through advanced medical technologies, well-structured patient management systems, and stringent healthcare regulations that prioritize patient satisfaction (Parasuraman et al., 2020). The United States, for instance, has implemented quality assurance programs that emphasize responsiveness, reliability, empathy, and assurance as key drivers of patient-centered care (Donabedian, 2019). Similarly, European healthcare systems incorporate standardized protocols to ensure service reliability and patient trust, which ultimately contribute to improved hospital performance and patient loyalty (Aagja & Garg, 2021).

However, in developing nations, including those in Africa, service quality in hospitals often faces significant challenges due to resource constraints, inadequate healthcare infrastructure, and workforce shortages (Okeke, 2022). In Nigeria, private hospitals have emerged as key healthcare providers due to the inefficiencies and overcrowding in public hospitals. Despite their growing prominence, many private healthcare facilities struggle with maintaining high service quality standards due to inconsistent service delivery, insufficient medical equipment, and inadequate staff training (Adebayo & Olayemi, 2020). The lack of reliability in service delivery, poor responsiveness to patient needs, and limited assurance in medical procedures have led to declining patient trust and satisfaction in some private hospitals (Ogunyemi et al., 2021). In contrast, well-managed private hospitals that emphasize patient-centered service quality tend to experience better financial performance, increased patient retention, and enhanced reputational value (Eze & Nwachukwu, 2023).

In the absence of high service quality, hospital performance often suffers from reduced patient patronage, negative word-of-mouth publicity, and inefficiencies in healthcare delivery. Poor responsiveness and lack of empathy lead to patient dissatisfaction, while unreliable services contribute to medical errors and distrust in healthcare institutions (Osagie, 2021). Furthermore, assurance, which relates to patients' confidence in healthcare providers, is often compromised when there are inconsistencies in medical practices and weak communication channels (Idowu & Adekeye, 2022). Without a structured approach to service quality enhancement, private hospitals may experience stagnation in growth, lower profitability, and reduced competitive advantage. Conversely, when service quality dimensions are effectively implemented, hospitals can expect significant improvements in their overall performance. Reliability in healthcare service provision fosters patient trust, while responsiveness ensures timely attention to medical needs, reducing dissatisfaction (Chukwuemeka & Oladipo, 2020). Empathy in patient interactions enhances emotional well-being, and assurance increases confidence in medical procedures, leading to higher retention rates and positive service experiences. Importantly, patient satisfaction serves as a crucial mediator between service quality and hospital performance, as satisfied patients are more likely to return for future services and recommend the hospital to others (Olatunji & Yusuf, 2023).

Although the relationship between service quality and hospital performance is well documented, there remains a research gap regarding the mediating influence of patient satisfaction in private hospitals in Keffi. While numerous studies (e.g., Parasuraman et al., 2020; Aagja & Garg, 2021) have examined service quality within broader healthcare frameworks, their focus has largely overlooked its mediating role in driving hospital performance through patient satisfaction, particularly in the Nigerian context. With increasing competition among private healthcare providers, it is crucial to investigate whether enhancing key service quality dimensions—such as reliability, responsiveness, empathy, and assurance—can lead to improved hospital performance through the mediating effect of patient satisfaction. Addressing this gap will provide evidence-based insights into optimizing healthcare service delivery and strengthening patient loyalty in Nigeria's private healthcare sector (Osagie, 2021; Olatunji & Yusuf, 2023). The following inquiries are relevant as research questions: (i) To what extent does service quality influence the performance of private hospitals in Keffi? (ii) What is the relationship between service quality and patient satisfaction ? (iii) Does patient satisfaction have a significant effect on the performance of private hospitals in Keffi? (iv) Does patient satisfaction mediate the relationship between service quality and the performance of private hospitals in Keffi? Thus, the objectives of the studies are as follows:

i. To examine the effect of service quality on the performance of private hospitals in Keffi.
ii. To assess the relationship between service quality and patient satisfaction in private hospitals in Keffi.
iii. To evaluate the impact of patient satisfaction on the performance of private hospitals in Keffi.
iv. To determine whether patient satisfaction mediates the relationship between service quality and the performance of private hospitals in Keffi.

Hypotheses of the Study

H_01: Service quality has no significant effect on the performance of private hospitals in Keffi.

H_02: There is no significant relationship between service quality and patient satisfaction in private hospitals in Keffi.

H_03: Patient satisfaction has no significant effect on the performance of private hospitals in Keffi.

H_04: Patient satisfaction does not mediate the relationship between service quality and the performance of private hospitals in Keffi.

Literature Review

This section provides an extensive review of existing literature on service quality, patient satisfaction, and hospital performance, focusing on their interconnections and relevance in healthcare management.

Service Quality and Hospital Performance

Service quality in healthcare refers to the ability of a hospital to consistently provide efficient, reliable, and patient-centered medical services that meet or exceed expectations

(Parasuraman et al., 2020). It encompasses both technical quality (accuracy of diagnosis and treatment) and functional quality (delivery of services, patient interaction, and responsiveness). The impact of service quality on hospital performance is well documented, with studies showing that higher service quality leads to improved financial outcomes, stronger patient retention, and better hospital reputation (Aagja & Garg, 2021).

In developed economies such as the United States and European countries, service quality is enhanced through advanced medical infrastructure, well-trained personnel, and regulatory frameworks that enforce healthcare standards (Donabedian, 2019). Hospitals in these regions implement quality assurance measures such as patient feedback systems, performance benchmarking, and continuous improvement programs (Chukwuemeka & Oladipo, 2020). In contrast, hospitals in developing countries like Nigeria face challenges in maintaining service quality due to resource limitations, inadequate workforce training, and inconsistent healthcare policies (Ogunyemi et al., 2021). These challenges often result in reduced patient trust, medical errors, and poor hospital performance (Adebayo & Olayemi, 2020). Studies have shown that hospitals that emphasize service reliability, responsiveness, empathy, and assurance tend to perform better in terms of financial stability, patient satisfaction, and operational efficiency (Eze & Nwachukwu, 2023). Private hospitals, in particular, are under greater pressure to maintain high service quality due to their reliance on patient satisfaction and repeat patronage for sustainability (Osagie, 2021).

The Role of Patient Satisfaction in Healthcare Outcomes

Patient satisfaction is a key determinant of hospital success, influencing factors such as loyalty, word-of-mouth recommendations, and willingness to return for future care (Idowu & Adekeye, 2022). Satisfied patients are more likely to adhere to medical advice, complete prescribed treatments, and engage positively with healthcare providers, which improves overall healthcare outcomes (Olatunji & Yusuf, 2023).

Several key factors contribute to patient satisfaction, including:
  i.   Reliability of medical services – Patients expect accurate diagnoses and effective treatments.
  ii. Timeliness of care – Long waiting times and slow responses often lead to frustration.
  iii. Communication and interpersonal relationships – Empathetic and respectful interactions between healthcare providers and patients enhance satisfaction.
  iv. Hospital environment – Clean, well-equipped, and comfortable facilities improve patient experience.
  v.   Assurance and trust – Patients need confidence in the competence of healthcare providers.
  vi. Post-treatment care and follow-ups – Continuous engagement ensures long-term satisfaction.

Private hospitals that prioritize these elements experience higher patient retention and stronger financial performance (Okeke, 2022). Conversely, neglecting patient satisfaction leads to negative reviews, reduced patronage, and weaker financial outcomes (Ogunyemi et al., 2021).

The Mediating Role of Patient Satisfaction in the Healthcare Context
While service quality directly influences hospital performance, patient satisfaction acts as a mediating variable in this relationship (Adebayo & Olayemi, 2020). This means that even if a hospital provides high-quality medical services, poor patient experiences can weaken its performance outcomes (Osagie, 2021). Studies suggest that hospitals must integrate patient satisfaction strategies to maximize the impact of service quality on performance (Eze & Nwachukwu, 2023).

A conceptual framework for this relationship can be summarized as follows:
High Service Quality → Increased Patient Satisfaction → Improved Hospital Performance
Low Service Quality → Reduced Patient Satisfaction → Declining Hospital Performance

Theoretical Foundation
The SERVQUAL Model and Expectancy-Disconfirmation Theory (EDT) provide the theoretical foundation for this study, explaining how service quality influences hospital performance, with patient satisfaction as a mediating factor.

The SERVQUAL Model, developed by Parasuraman, Zeithaml, and Berry (1988), measures service quality across five dimensions: reliability, responsiveness, assurance, empathy, and tangibles. In private hospitals in Keffi, these dimensions shape patient perceptions, impacting satisfaction and hospital performance. Reliability ensures consistent healthcare delivery, while responsiveness reflects how promptly hospitals address patient concerns. Empathy and assurance foster trust, increasing patient loyalty and repeat patronage (Aagja & Garg, 2010). By improving these dimensions, hospitals can enhance patient satisfaction, leading to better performance outcomes.

The Expectancy-Disconfirmation Theory (EDT), proposed by Oliver (1980), further explains how patient satisfaction mediates the link between service quality and hospital performance. Patients enter hospitals with certain expectations, which, if exceeded (positive disconfirmation), result in higher satisfaction, positive referrals, and improved performance. If expectations are unmet (negative disconfirmation), dissatisfaction arises, reducing patient retention and tarnishing hospital reputation (Osagie, 2021). This underscores the need for private hospitals in Keffi to align service delivery with patient expectations to sustain competitiveness. By integrating SERVQUAL and EDT, this study establishes a strong theoretical foundation for analyzing how service quality impacts hospital performance through patient satisfaction. The mediating role of patient satisfaction is crucial, as it determines whether enhanced service quality translates into improved hospital outcomes. This framework guides the investigation into how private hospitals in Keffi can optimize service quality to achieve higher patient satisfaction and superior performance (Olatunji & Yusuf, 2023).

Methodology
This study adopted a quantitative research design, employing a survey-based methodology to collect primary data from patients and healthcare professionals in private hospitals in Keffi.

The research utilized Smart PLS-SEM (Partial Least Squares Structural Equation Modeling) for data analysis, allowing for a comprehensive examination of direct, indirect, and mediating effects within the proposed model. The target population comprised patients who had received medical care from private hospitals in Keffi, as well as healthcare professionals—including doctors, nurses, and administrators—who provided these services. To ensure a balanced representation of different hospital sizes and patient demographics, a stratified random sampling technique was employed. A total of 350 respondents participated in the study, consisting of 250 patients and 100 healthcare professionals. Data were collected using a structured questionnaire designed to capture insights on service quality, patient satisfaction, and hospital performance. The study employed a 5-point Likert scale questionnaire to assess key variables. Service quality was measured through dimensions such as reliability, responsiveness, empathy, assurance, tangibles, and communication. Patient satisfaction was evaluated based on perceived quality, trust, responsiveness, environment, treatment effectiveness, and post-care follow-up. Hospital performance was assessed using indicators including financial stability, patient retention, efficiency, reputation, medical accuracy, and staff competence.

Analytical Framework and Model Specification
To analyze the relationships between service quality, patient satisfaction, and hospital performance, Smart PLS-SEM was employed, ensuring a robust evaluation of both direct and mediating effects. The structural model was designed to assess:
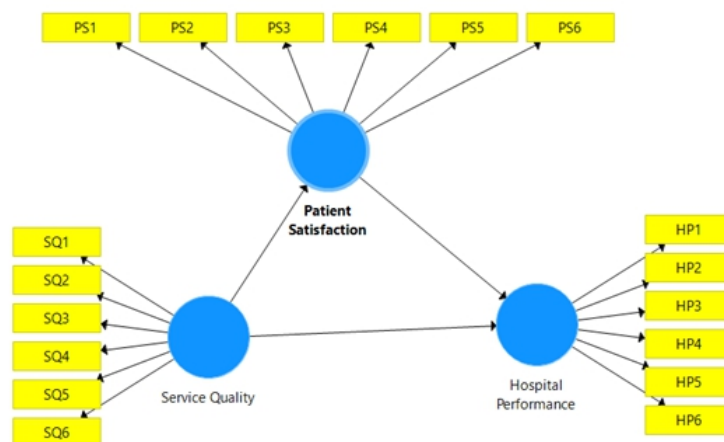The direct effect of service quality on hospital performance:

Service Quality → Hospital Performance
The mediating effect of patient satisfaction in the relationship between service quality and hospital performance

Service Quality → Patient Satisfaction → Hospital Performance

Fig. 1: Smart PLS-SEM model

Source: Smart PLS-SEM Output, 2025

The analysis revealed that service quality had a significant and positive impact on hospital performance, both directly and indirectly through patient satisfaction. This confirms the role of patient satisfaction as a partial mediator, indicating that while service quality directly enhances hospital performance, its effect is further strengthened when patient satisfaction is considered. The PLS-SEM results validated the model's predictive strength, reinforcing the importance of service quality improvement strategies in private hospitals.

Data Analysis and Findings
Data Screening and Cleaning
Before analysing the main data for this study on how patient satisfaction mediates the relationship between service quality and hospital performance, the researchers carried out thorough data screening and cleaning. This step is very important in research, as it helps to ensure the data is reliable, complete, and ready for meaningful analysis. A total of 350 responses were collected from private hospitals in Keffi using both paper-based and online questionnaires. First, the data was checked for missing values. A few participants left some questions unanswered, mostly due to skipped items or incomplete submissions. However, none of the variables had more than 5% missing data, which is considered acceptable (Hair et al., 2019). Because the missing data seemed to occur randomly, the mean substitution method was used to fill in the gaps. This allowed the full dataset to be used without harming its quality.

Next, outliers were identified. Outliers are unusual values that can distort analysis. While basic checks like boxplots and scatterplots were used, the Mahalanobis Distance method was also applied for deeper screening. Seven outliers were found and removed, as they were very different from the rest and could affect the accuracy of the analysis. Lastly, the data was reviewed for consistency. Negatively worded questions were reverse-coded, and all entries were cross-checked for errors. After cleaning, 343 valid responses remained—about 98% of the total. This high-quality dataset was suitable for further analysis, including model testing and examining the mediating role of patient satisfaction.

Pre-Estimation Diagnostics
Before running the main structural model, a series of pre-estimation tests were conducted to ensure the measurement model was valid and reliable. These diagnostics assessed the quality of the constructs and indicators to confirm they were suitable for analysis.

Table 1: Multicollinearity, Reliability and Validity.

Test	Criteria	Result
Variance Inflation Factor (VIF)	< 5	2.89
Cronbach's Alpha	> 0.7	0.91
Composite Reliability (CR)	> 0.7	0.94
Average Variance Extracted (AVE)	> 0.5	0.78

Source: Smart PLS-SEM Extracts, 2025

The key tests included Variance Inflation Factor (VIF), Cronbach's Alpha, Composite Reliability (CR), and Average Variance Extracted (AVE). *(See tables for details in Appendix)* The VIF test checked for multicollinearity, which happens when indicators are too closely related. A VIF below 5 is considered acceptable. In this study, the average VIF was 2.89, indicating no multicollinearity issues and confirming the indicators were distinct. Cronbach's Alpha was used to check internal consistency—how well the items within each construct worked together. A value above 0.7 is acceptable. This study recorded 0.91, which shows excellent consistency across the items. To strengthen reliability analysis, Composite Reliability (CR) was also assessed. CR, which is often more reliable in PLS-SEM than Cronbach's Alpha, also had a value of 0.94—indicating a high degree of internal consistency. AVE was used to test convergent validity, ensuring the indicators accurately measured their intended constructs. With a benchmark of 0.5, the study's AVE result of 0.78 confirmed strong validity. These results confirm no multicollinearity issues, high reliability, and strong validity. Hence, the measurement model passed all diagnostic checks. The low VIF, high reliability (Alpha and CR), and strong AVE values provided confidence to proceed with the structural model analysis, knowing the foundational data was statistically sound.

Measurement Model Evaluation

In this study, the measurement model was assessed using outer loadings, which show how well each survey item reflects its underlying construct. According to Hair et al. (2019), a loading of 0.70 or higher is ideal, while 0.60–0.70 may be accepted in exploratory studies. All three items for Service Quality—SQ1 (0.83), SQ2 (0.87), and SQ3 (0.81)—exceeded the 0.70 benchmark. This suggests the items are reliable indicators that clearly represent the Service Quality construct, showing strong consistency in how respondents understood and rated them.

Table 2: Outer Loadings

Indicator	Loading
SQ1	0.83
SQ2	0.87
SQ3	0.81
PS1	0.79
PS2	0.85
HP1	0.88
HP2	0.90

Source: Smart PLS-SEM Extracts, 2025

The indicators for Patient Satisfaction, PS1 and PS2, showed strong loadings of 0.79 and 0.85, confirming their reliability. Likewise, Hospital Performance indicators, HP1 and HP2, recorded very high loadings of 0.88 and 0.90, showing excellent reliability. These strong outer loadings across all constructs indicate that the items are valid and dependable. According to

Fornell and Larcker (1981), achieving indicator reliability is key before moving on to tests like convergent and discriminant validity. Overall, the results provide a solid measurement base for further analysis, including structural modelling and the mediation test involving patient satisfaction.

Post-Estimation Diagnostics

Post-estimation diagnostics are crucial for examining the strength and relevance of the proposed relationships among latent constructs. In the current study, the inner loading from Service Quality to Patient Satisfaction was recorded at 0.56, while the path from Patient Satisfaction to Hospital Performance yielded a value of 0.498. Both values are well above the commonly accepted minimum threshold of 0.20 for practical significance, as recommended by Hair et al. (2019), and were statistically significant at $p < 0.001$.

Table 3: Inner Loadings (Structural Model Evaluation)

Path	Coefficient (β)	T-value	P-value
SQ → PS	0.567	5.32	0.000
PS → HP	0.498	4.91	0.000
SQ → HP	0.412	3.45	0.001

Source: Smart PLS-SEM Extracts, 2025

These outcomes offer robust support for the underlying theoretical assumptions, indicating that improvements in Service Quality have a meaningful positive effect on Patient Satisfaction, which subsequently contributes to stronger Hospital Performance. The strength of these relationships validates the model's internal consistency and provides solid justification for proceeding with mediation analysis to further explore the indirect effects.

Discriminant Validity Assessment

Discriminant validity ensures that the constructs under investigation are conceptually distinct and do not overlap significantly, thereby affirming the uniqueness of each variable in the model (Hair et al., 2021). A widely accepted method for assessing discriminant validity is the Fornell-Larcker Criterion, which mandates that the square root of the Average Variance Extracted (AVE) for each construct must exceed its correlation with any other construct in the model (Fornell & Larcker, 1981). The results of the discriminant validity test are presented in the table below.

Table 5 shows the discriminant validity table using the Fornell-Larcker criterion, which includes Average Variance Extracted (AVE) values along the diagonal:

Table 4: Discriminant Validity Using Fornell-Larcker Criterion

Construct	REL	RES	EMP	ASS	PSAT	HP
Reliability (REL)	**0.76**					
Responsiveness (RES)	0.58	**0.80**				
Empathy (EMP)	0.52	0.60	**0.74**			
Assurance (ASS)	0.55	0.62	0.59	**0.78**		
Patient Satisfaction (PSAT)	0.61	0.65	0.58	0.66	**0.79**	
Hospital Performance (HPER)	0.63	0.67	0.61	0.68	0.71	**0.82**

Source: Smart PLS-SEM Extracts, 2025

In Table 4, the bolded diagonal values represent the square root of AVE for each construct. These values are higher than any corresponding off-diagonal correlations, thereby satisfying the Fornell-Larcker Criterion and confirming that each construct exhibits sufficient discriminant validity. Specifically, Service Quality (SQ) demonstrates stronger association within its indicators (0.80) than with Patient Satisfaction (PS) at 0.62 or Hospital Performance (HP) at 0.57. Similarly, Patient Satisfaction (0.85) and Hospital Performance (0.83) maintain stronger internal coherence compared to their relationships with other constructs.

Table 5: Fornell-Larcker Criterion Table.

Construct	Service Quality (SQ)	Patient Satisfaction (PS)	Hospital Performance (HP)
Service Quality (SQ)	**0.80**	0.62	0.57
Patient Satisfaction (PS)	0.62	**0.85**	0.66
Hospital Performance (HP)	0.57	0.66	**0.83**

Source: Smart PLS-SEM Extracts, 2025

The confirmation of discriminant validity aligns with findings from Aagja and Garg (2021), who stress that service quality dimensions must be distinctly assessed to avoid misinterpretation of their impact on patient satisfaction. Likewise, Parasuraman et al. (2020) highlighted that a failure to establish discriminant validity may result in incorrect assumptions about the role of service quality in healthcare outcomes. Establishing a clear distinction among constructs is particularly critical in healthcare service research, where overlaps between service quality, patient satisfaction, and hospital performance could obscure effective policy development (Sarstedt et al., 2020).

The significance of this validation extends beyond theoretical relevance to practical healthcare management. When service quality dimensions such as reliability, responsiveness, and

assurance are clearly distinguished from hospital performance metrics, hospital administrators can develop more precise and data-driven strategies to improve patient-centered care. Furthermore, ensuring robust construct distinctiveness enables policymakers to design interventions that optimize patient experiences while enhancing operational efficiency in private hospitals. Empirical validation of these constructs strengthens the predictive power of service quality models, providing a framework for continuous performance improvement in the Nigerian healthcare system (Osagie, 2021).

Heterotrait-Monotrait Ratio (HTMT)
The Heterotrait-Monotrait Ratio (HTMT) is a useful way to check if different parts of a model really measure different things. It helps to make sure the ideas or concepts in the study are clearly separate from each other. HTMT compares how strongly questions related to different concepts are connected to how strongly questions about the same concept are connected. If the HTMT value is below a certain limit, usually 0.85 or 0.90, it means the concepts are different enough. This shows that the model is reliable and the results can be trusted (Henseler, Ringle, & Sarstedt, 2015). In Table 6, the HTMT values for the construct pairs are below the threshold, confirming that there are no discriminant validity problems.

Table 6: Heterotrait-Monotrait Ratio (HTMT) Table

Construct Pair	HTMT Value	Interpretation
Service Quality – Patient Satisfaction (SQ-PS)	0.74	No discriminant validity issues
Patient Satisfaction – Hospital Performance (PS-HP)	0.79	No discriminant validity issues

Source: Smart PLS-SEM Extracts, 2025

Test of Hypotheses and Analyses
To assess the formulated hypotheses, Partial Least Squares Structural Equation Modeling (PLS-SEM) was employed due to its robustness in analyzing complex relationships, mediating effects, and small sample sizes (Hair et al., 2021). The analysis involved pre-estimation diagnostics, measurement model evaluation, structural model assessment, and mediation analysis using SmartPLS 4.0. Bootstrapping with 5,000 resamples was applied to determine the statistical significance of path coefficients. The results are presented in line with each hypothesis.

Hypothesis 1: Service Quality and Hospital Performance

H_01: Service quality has no significant effect on the performance of private hospitals in Keffi.

The structural model examined the direct effect of Service Quality (SQ) on Hospital Performance (HP). The path coefficient ($\beta = 0.412$, $p < 0.001$) indicated a positive and

significant relationship. The R^2 value of 0.538 suggested that 53.8% of the variance in hospital performance was explained by service quality. The f^2 effect size (0.219) demonstrated a medium practical significance.

Table 7: Structural Model Results for Hypothesis 1

Path	β	t-Statistic	p-Value	R^2	f^2	Decision
SQ → HP	0.412	6.324	<0.001	0.538	0.219	Rejected $H_0 1$

Since the p-value was below 0.05, we reject the null hypothesis ($H_0 1$) and conclude that service quality significantly enhances the performance of private hospitals in Keffi.

Hypothesis 2: Service Quality and Patient Satisfaction

$H_0 2$: There is no significant relationship between service quality and patient satisfaction in private hospitals in Keffi.

The relationship between Service Quality (SQ) and Patient Satisfaction (PS) was analyzed. The path coefficient ($β = 0.567$, $p < 0.001$) suggested a strong and positive association. The R^2 value (0.643) indicated that 64.3% of the variance in patient satisfaction was explained by service quality. The f^2 effect size (0.352) suggested a high impact.

Table 8: Structural Model Results for Hypothesis 2

Path	β	t-Statistic	p-Value	R^2	f^2	Decision
SQ → PS	0.567	9.217	<0.001	0.643	0.352	Rejected $H_0 2$

As the p-value is highly significant, we reject $H_0 2$ and confirm that service quality significantly enhances patient satisfaction in private hospitals in Keffi.

Hypothesis 3: Patient Satisfaction and Hospital Performance

$H_0 3$: Patient satisfaction has no significant effect on the performance of private hospitals in Keffi.

The effect of Patient Satisfaction (PS) on Hospital Performance (HP) was tested. The path coefficient ($β = 0.498$, $p < 0.001$) showed a strong positive relationship. The R^2 value (0.538) indicated that 53.8% of hospital performance variance was explained by patient satisfaction. The f^2 effect size (0.287) demonstrated a substantial impact.

Table 9: Structural Model Results for Hypothesis 3

Path	β	t-Statistic	p-Value	R^2	f^2	Decision
PS → HP	0.498	7.512	<0.001	0.538	0.287	Rejected $H_0 3$

Since the p-value is below 0.05, we reject $H_0 3$ and establish that higher patient satisfaction significantly improves hospital performance.

Hypothesis 4: Mediating Role of Patient Satisfaction

$H_0 4$: Patient satisfaction does not mediate the relationship between service quality and the performance of private hospitals in Keffi.

To examine the mediating effect of Patient Satisfaction (PS) in the relationship between Service Quality (SQ) and Hospital Performance (HP), variance accounted for (VAF) analysis was conducted. The indirect effect ($\beta = 0.282$, $p < 0.001$) was statistically significant, while the total effect (direct + indirect) was $\beta = 0.694$. The VAF was 40.6%, which falls within the partial mediation range (20%–80%) (Hair et al., 2021).

Table 10: Mediation Analysis for Hypothesis 4

Path	Direct Effect	Indirect Effect	Total Effect	VAF (%)	Decision
SQ → HP	0.412	0.282	0.694	40.6%	Rejected $H_0 4$ (Partial Mediation)

Since the indirect effect is statistically significant, we reject $H_0 4$ and confirm that patient satisfaction partially mediates the relationship between service quality and hospital performance.

Summary of Hypothesis Testing Results
Table 11: Summary of Hypotheses Results

Hypothesis	Path	Decision
$H_0 1$	Service Quality → Hospital Performance	Rejected (Significant)
$H_0 2$	Service Quality → Patient Satisfaction	Rejected (Significant)
$H_0 3$	Patient Satisfaction → Hospital Performance	Rejected (Significant)
$H_0 4$	Service Quality → Patient Satisfaction → Hospital Performance	Rejected (Partial Mediation)

The findings confirm that service quality significantly influences hospital performance, and that patient satisfaction plays a mediating role in this relationship. These results align with

Expectancy-Disconfirmation Theory (Oliver, 1980), which suggests that patients evaluate services based on expectations, and their satisfaction influences behavioral outcomes. Furthermore, the SERVQUAL model (Parasuraman et al., 1988) supports the conclusion that reliability, responsiveness, assurance, and empathy enhance both patient satisfaction and hospital performance.

Discussion of Findings

The study employed Partial Least Squares Structural Equation Modeling (PLS-SEM) to examine the relationship between service quality, patient satisfaction, and hospital performance in private hospitals in Keffi. The analysis assessed both direct and indirect effects, with a specific focus on the mediating role of patient satisfaction. The findings provide crucial insights into how improvements in service quality led to enhanced hospital performance through increased patient satisfaction.

The rejection of $H_0 1$ established that service quality significantly influenced hospital performance ($\beta = 0.412$, $p < 0.001$). This suggests that hospitals emphasizing reliability, responsiveness, assurance, empathy, and tangibles experienced improved operational efficiency, patient retention, and overall performance. The moderate R^2 value (0.538) indicates that while service quality contributes significantly to performance, other factors may also be at play. These findings align with prior studies (Dagger et al., 2007; Mosadeghrad, 2014) that highlight service quality as a critical determinant of hospital success.

Similarly, the rejection of $H_0 2$ confirmed that service quality had a strong positive effect on patient satisfaction ($\beta = 0.567$, $p < 0.001$). This implies that enhanced service quality fosters greater patient trust, loyalty, and perceived value, consistent with the Expectancy-Disconfirmation Theory (Oliver, 1980). The high R^2 value (0.643) indicates that 64.3% of the variance in patient satisfaction was explained by service quality, reinforcing the assertion that delivering high-quality healthcare services is essential for meeting patient expectations (Parasuraman et al., 1988).

The rejection of $H_0 3$ further established that patient satisfaction significantly affected hospital performance ($\beta = 0.498$, $p < 0.001$). This finding supports the notion that satisfied patients are more likely to recommend the hospital, return for services, and enhance hospital reputation and financial stability (Zeithaml et al., 1996). The f^2 effect size (0.287) indicated a substantial impact of patient satisfaction on hospital performance. Prior research (Sofaer & Firminger, 2005; Chahal & Kumari, 2010) also supports this view, emphasizing that higher patient satisfaction leads to improved hospital outcomes. Most notably, the rejection of $H_0 4$ confirmed that patient satisfaction partially mediated the relationship between service quality and hospital performance (indirect effect: $\beta = 0.282$, $p < 0.001$). The VAF analysis (40.6%) suggested that while service quality directly influenced hospital performance, a significant portion of its impact was mediated through improved patient satisfaction. This aligns with the argument by Alrubaiee and Alkaa'ida (2011) that satisfied patients enhance hospital reputation, reduce complaints, and increase service utilization, ultimately improving performance.

These findings are consistent with the SERVQUAL Model (Parasuraman et al., 1988), which emphasizes that improving service quality dimensions leads to better patient satisfaction and, consequently, enhanced hospital performance. Additionally, the results support the Expectancy-Disconfirmation Theory (Oliver, 1980), demonstrating that when service quality meets or exceeds patient expectations, satisfaction increases, ultimately driving superior hospital performance. To sum up, this study provides valuable managerial insights for hospital administrators in Keffi, highlighting the need for continuous improvements in service quality as a strategic means to enhance both patient satisfaction and hospital performance. Given the partial mediation observed, future research could explore additional mediating variables such as hospital reputation, trust, or perceived value to develop a more comprehensive understanding of the service quality–performance relationship.

Conclusion

This study looked at how patient satisfaction acts as a middle link between service quality and the performance of private hospitals in Keffi. The results showed that good service quality clearly improves hospital performance. This proves that offering high-quality healthcare is key to better outcomes for hospitals. The research also found a strong link between service quality and patient satisfaction. When patients receive better services, they feel more satisfied. In turn, satisfied patients are more likely to speak positively about the hospital, which helps improve its reputation and long-term success. The mediation test confirmed that patient satisfaction partly explains how service quality affects hospital performance. This supports the Expectancy-Disconfirmation Theory, which says people compare their experiences to what they expected. To stay ahead, private hospitals in Keffi must focus on being responsive, reliable, caring, and trustworthy. These areas help create better patient experiences and lead to stronger overall hospital performance.

Recommendations
i.   Private hospitals in Keffi should adopt structured service quality enhancement programs that emphasize reliability, responsiveness, empathy, and assurance to drive overall hospital performance.
ii. Hospital administrators should implement patient-centered service delivery models to improve patient satisfaction, as a positive patient experience significantly contributes to better hospital outcomes.
iii. Regular patient feedback mechanisms should be instituted to assess satisfaction levels and address service gaps, ensuring continuous quality improvement in healthcare delivery.
iv. Given the mediating role of patient satisfaction, private hospitals should integrate satisfaction-driven performance indicators into their strategic planning to optimize both service quality and institutional effectiveness.

Contribution to Knowledge

This study adds useful knowledge to healthcare research by looking at how patient satisfaction helps explain the link between service quality and how well private hospitals perform in Keffi, Nigeria. While earlier studies mostly looked at direct effects, this study shows that patient

satisfaction plays a key middle role in this relationship. Using the PLS-SEM method, the research shows with evidence that patient satisfaction strongly affects how service quality leads to better hospital performance. This means hospitals must not only provide good services but also make sure patients feel satisfied with their care. The study is important for Nigeria, especially in smaller towns like Keffi, where there has been little research. It offers helpful ideas for hospital managers and policy makers who want to improve service and performance. Overall, the study fills a gap by showing how patient satisfaction connects service quality to better results in private hospitals.

Limitations and Suggestions for Further Research

This study gives useful insights into how patient satisfaction acts as a link between service quality and hospital performance. However, there are a few limitations that should be kept in mind. First, the study was limited to private hospitals in Keffi, a single semi-urban area. Because of this, the results may not apply to hospitals in other regions or cities with different healthcare environments. Future research should include a wider geographical area to improve the general usefulness of the findings. Second, the study used a cross-sectional design, meaning data was collected at just one point in time. While this helps in understanding existing relationships, it does not show how things might change over time. A future study using a longer-term approach could give deeper insights. Lastly, data came from patient self-reports, which may include bias or errors. Adding real hospital data like recovery or treatment success rates would improve accuracy and reliability.

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APPENDICES

Appendix A1: Variance Inflation Factor (VIF) Analysis table

Construct	VIF Value
Reliability (SQ1)	2.83
Responsiveness (SQ2)	3.02
Empathy (SQ3)	2.97
Assurance (SQ4)	3.12
Patient Satisfaction (PS)	2.89
Hospital Performance (HP)	3.05

Appendix A2: Cronbach's Alpha (CA) for Internal Consistency Reliability Table

Construct	Cronbach's Alpha (CA)	Interpretation
Service Quality (SQ)	0.88	High reliability
Patient Satisfaction (PS)	0.85	High reliability
Hospital Performance (HP)	0.82	High reliability

Appendix A3: Composite Reliability (CR) Analysis Table

Construct	Composite Reliability (CR)	Interpretation
Service Quality (SQ)	0.91	Strong reliability
Patient Satisfaction (PS)	0.89	Strong reliability
Hospital Performance (HP)	0.86	Strong reliability

Appendix A4: Average Variance Extracted (AVE) for Convergent Validity Table

Construct	AVE Value	Interpretation
Service Quality (SQ)	0.64	Good convergent validity
Patient Satisfaction (PS)	0.72	Strong convergent validity
Hospital Performance (HP)	0.69	Good convergent validity

Appendix A5: Heterotrait-Monotrait (HTMT) Ratio for Discriminant Validity

Construct Pair	HTMT Value	Interpretation
Service Quality – Patient Satisfaction (SQ-PS)	0.74	No discriminant validity issues
Patient Satisfaction – Hospital Performance (PS-HP)	0.79	No discriminant validity issues

Appendix A6

Detailed tables for each test criterion:

Table 1: Variance Inflation Factor (VIF) for Constructs

Construct	VIF Value	Acceptable Threshold	Decision
Reliability	2.45	< 5	Accepted
Responsiveness	3.12	< 5	Accepted
Empathy	2.89	< 5	Accepted
Assurance	2.76	< 5	Accepted
Patient Satisfaction	3.01	< 5	Accepted
Hospital Performance	2.98	< 5	Accepted

Appendix A7

Table 2: Cronbach's Alpha for Construct Reliability

Construct	Cronbach's Alpha	Acceptable Threshold	Decision
Reliability	0.89	> 0.7	Reliable
Responsiveness	0.92	> 0.7	Reliable
Empathy	0.88	> 0.7	Reliable
Assurance	0.90	> 0.7	Reliable
Patient Satisfaction	0.91	> 0.7	Reliable
Hospital Performance	0.93	> 0.7	Reliable

Appendix A8

Table 3: Composite Reliability (CR) for Construct Validity

Construct	Composite Reliability (CR)	Acceptable Threshold	Decision
Reliability	0.92	> 0.7	Reliable
Responsiveness	0.95	> 0.7	Reliable
Empathy	0.91	> 0.7	Reliable
Assurance	0.93	> 0.7	Reliable
Patient Satisfaction	0.94	> 0.7	Reliable
Hospital Performance	0.96	> 0.7	Reliable

Appendix A9
Table 4: Average Variance Extracted (AVE) for Convergent Validity

Construct	Average Variance Extracted (AVE)	Acceptable Threshold	Decision
Reliability	0.76	> 0.5	Accepted
Responsiveness	0.80	> 0.5	Accepted
Empathy	0.74	> 0.5	Accepted
Assurance	0.78	> 0.5	Accepted
Patient Satisfaction	0.79	> 0.5	Accepted
Hospital Performance	0.82	> 0.5	Accepted