A QUANTITATIVE ANALYSIS OF HOW MEDICAL STAFF SERVICE QUALITY DIMENSIONS AFFECT PATIENT SATISFACTION USING THE SERVQUAL MODEL

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ABSTRACT

Background: Patient satisfaction is a key indicator of the quality of medical services and overall healthcare performance. It reflects how well healthcare providers meet patients' expectations regarding care, communication, treatment outcomes, and the hospital environment. Recognizing the growing importance of patient-centered care, this study examines how the quality of services provided by medical staff directly affects patient satisfaction in the hospital, using the SERVQUAL model's five dimensions: Reliability, Assurance, Tangibles, Empathy, and Responsiveness. Methodology: Our study was a cross-sectional study conducted from April to June 2025 at JSS Hospital, a tertiary-level teaching hospital among 320 patients using a structured questionnaire based on the SERVQUAL model, adapted to the healthcare context. The instrument included 22 items covering five service quality dimensions—Reliability, Assurance, Tangibles, Empathy, and Responsiveness—as well as items measuring overall satisfaction. Results: Results indicated that overall satisfaction was moderate [Mean = 3.32], with Responsiveness [2.53] and Empathy [2.50] scoring the highest, and Assurance [2.41] and Tangibles [2.39] scoring the lowest. A moderately strong positive relationship [R = 0.647, p < 0.001] existed between service quality and satisfaction, with the model accounting for 41.9% of the variance [R^2 = 0.419]. Regression showed Reliability, Empathy, and Responsiveness as significant predictors [p < 0.05]; Assurance and Tangibles were not. Conclusion: These findings underscore that enhancing Reliability, Empathy, and Responsiveness is crucial for increasing patient satisfaction, guiding administrators on where to focus improvements for better patient-centered care.

Keywords: Patient satisfaction, SERVQUAL model, Medical services

INTRODUCTION

In today's highly competitive environment, achieving strong patient satisfaction has become a cen- tral focus for both researchers and industry profession- als. This is particularly true in the service sector, where organizations increasingly prioritize enhancing service quality as a key strategy for boosting customer satisfac- tion [1].

Patient satisfaction is a key indicator of the quality of medical services and overall healthcare performance. It reflects how well healthcare providers meet patients' expectations regarding care, communication, treatment outcomes, and the hospital environment. High-quality medical service not only ensures accurate diagnosis and effective treatment but also emphasizes empathy, timely response, and respect for patient needs and preferences. When patients perceive that their concerns are heard and they receive personalized, compassionate care, their satisfaction increases, leading to higher trust and better adherence to medical advice. Consequently, improving medical service quality directly contributes to enhanced patient satisfaction, loyalty, and positive health out- comes. High satisfaction levels encourage positive word -of-mouth, reduced complaints, and improved patient retention, making it essential for healthcare institutions to continuously assess and enhance their service quality. High-quality care improves outcomes, fosters trust, enhances adherence, and enhances reputation. Thus, patient satisfaction is a key metric.

The healthcare sector values service quality in shaping patient experience and satisfaction. As care shifts to patient-centered models, identifying key quality factors guides policy and hospital management. Patient satisfaction is a main indicator of hospital effectiveness and care quality.

This study assessed the service quality of medical staff using SERVQUAL and examined its impact on patient satisfaction. The goal is to identify key predictors that will guide quality improvements.

By identifying the service factors that matter most, this study fills a research gap and provides recommendations to enhance patient-centered care. The results guide providers and policymakers in improving strategies for enhancing satisfaction and loyalty.

LITERATURE REVIEW

Patient satisfaction comes from more than clinical results. Interactions, empathy, communication, and the environment also play a role. High service quality fosters trust and loyalty, while poor experiences lead to dissatisfaction and lower retention rates.

Numerous studies employ the SERVQUAL model to

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examine the relationship between service quality and patient satisfaction. SERVQUAL evaluates five dimensions: tangibles, reliability, responsiveness, assurance, and empathy.

Reliability means a hospital can deliver services as promised. Many studies have shown that it is essential for satisfaction. This is supported by Simbolon et al. [2021] and Kitapci et al. [2014], who observed strong associations between reliability and inpatient satisfaction through multivariate analyses in Indonesia and Turkish hospitals respectively.

Empathy, or the degree of individualized, compassionate care provided, is crucial in shaping positive patient experiences. Simbolon et al. [2021] further found that empathy exhibits the strongest statistical relationship with patient satisfaction in Indonesian hospitals, even surpassing reliability and responsiveness.

Responsiveness—encompassing the promptness and willingness of healthcare staff to assist Parasuraman, Zeithaml and Berry's SERVQUAL model first identified responsiveness as a core dimension shaping service perceptions, and subsequent empirical studies have reinforced its significance. Amin and Nasharuddin demonstrated that responsiveness not only improves satisfaction but also drives behavioral intentions such as patient loyalty and repeat visits.

Tangibles [physical facilities, equipment, and appearance] and assurance [staff competence and courtesy] have yielded mixed results in their impact on satisfaction. Yunningsih et al. [2022] observed that while physical facilities, equipment, and staff appearance contribute to initial impressions, they do not strongly predict satisfaction unless supported by reliable and responsive service delivery.

Large-scale systematic reviews, such as Ferreira et al. [2023] conclude that no single SERVQUAL dimension is sufficient in isolation; rather, patient satisfaction results from the combined effects of all five factors, particularly interpersonal skills, clear communication, and reliable, timely service. Studies from Pakistan, India, the Middle East, and other low- and middle-income contexts confirm this multidimensional relationship, emphasizing that regular use of the SERVQUAL instrument can enhance patient satisfaction over time by identifying gaps and informing quality improvement strategies.

MATERIALS AND METHODS

This cross-sectional study was conducted at JSS Hospital, an 1800-bed tertiary care teaching hospital, between April and June 2025. The study involved 320 patients who had received hospital care for at least 2 days. Participants were selected by convenience sampling. The inclusion criteria required sufficient experience with hospital services to provide perceptual evaluations [at least 2 days stay at hospital]. Patients stay for less than 2 days excluded. The data was collected after obtaining approval from the head of the institution and after obtaining informed consent from patients using a structured questionnaire based on the SERVQUAL model, adapted to the healthcare context . The instrument includ- ed 22 items covering five service quality dimensions- Reliability, Assurance, Tangibles, Empathy, and

Respon- siveness-as well as items measuring overall satisfaction. Responses were captured on a 5-point Likert scale [1 = strongly disagree to 5 = strongly agree], indicating in- creasing levels of positive perception. The survey was conducted through self-completion under supervision by trained research staff to ensure clarity of understanding and completeness. Demographic data, including gender, age, marital status, and education, were also collected in addition to the SERVQUAL items. Data was entered into MS Excel and analyzed using SPSS SOFT-WARE VER- SION 22. The data was analyzed using both descriptive and inferential statistics. Descriptive statistics [frequency, mean, standard deviation] summarized demographic char- acteristics and SERVQUAL ratings. Correlation analysis was used to assess the strength of relationships between service quality dimensions and customer satisfaction. Regression analysis determined the predictive effect of each SERVQUAL dimension on patient satisfaction. A significant threshold of $p < 0.05$ was applied throughout the analysis.

Table 1: Questionnaire Items

Reliability
1. When the hospital promises to do something by a certain time it does so
2. When you have a problem, the hospital shows a sincere interest in solving it
3. The hospital gets things right the first time
4. The hospital insists on error-free records
Assurance
1. The behaviour of personnel in the hospital instils confidence in you
2. You feel safe in your dealings with the hospital
3. Personnel in the hospital are consistently courteous with you
4. Personnel in the hospital have the knowledge to answer your questions
Tangibles
1. The hospital has modern-looking equipment
2. The physical facilities in the hospital are visually appealing
3. Personnel in the hospital are neat in appearance
4. Materials associated with the service [such as pamphlets or statements] are visually appealing
Empathy
1. The hospital gives you individual attention
2. The hospital has operating hours convenient to all its patients
3. The hospital has your best interests at heart
4. The personnel of the hospital understand your specific needs
Responsiveness
1. The personnel in the hospital tell you exactly when services will be performed
2. Personnel in the hospital gives you prompt service
3. Personnel in the hospital are always willing to help you
4. Personnel in the hospital are never be too busy to respond to your requests
Level of patient satisfaction in the hospital
How satisfied are you with the overall services provided by the hospital

RESULTS

This study This study demonstrates that service quality dimensions are pivotal in shaping patient satisfaction within hospital environments. The findings are consistent with previous
SERVQUAL-based healthcare research, indicating that reliability, empathy, and responsiveness are central determinants of positive patient perceptions.

Table 2: Demographic characteristics.

		Frequency	Percent
Gender	Female	120	37.5
	Male	200	62.5
Marital status	Divorced	3	0.9
	Married	244	76.3
	Single	56	17.5
	Widowed	17	5.3
Age	< 20 years old	15	4.7
	> 40 years old	168	52.5
	20 to 30 years old	72	22.5
	31 to 40 years old	65	20.3
Education level	Bachelor	97	30.3
	Diploma	68	21.3
	Elementary/ intermediate	43	13.4
	Illiterate	23	7.2
	Masters/PhD	23	7.2
	Secondary school	66	20.6

From the table 2 it shows that, of the 320 participants, 62.5% were male and 37.5% were female. The majority were married [76.3%], and 52.5% were over 40 years of age, indicating an adult-dominated sample. Regarding educational background, 30.3% held a bachelor's degree and 21.3% had a diploma, reflecting a well- educated patient population. These demographics indi- cate that participants were mature and experienced healthcare consumers, capable of providing informed evaluations of hospital service quality.

Male respondents made up 62.5% of the sample, while female respondents made up 37.5%, according to the demographic profile of study participants. Married people made up most participants [76.3%], while single people made up 17.5%, widowed people made up 5.3%, and divorced people made up 0.9%. The age distribution showed that the majority [52.5%] were over 40, followed by those between the ages of 20 and 30 [22.5%], 31 and 40 [20.3%], and under 20 [4.7%]. The largest educational group had a bachelor's degree [30.3%], followed by diploma holders [21.3%] and secondary school graduates [20.6%]. Only 13.4% had completed primary or intermediate school, compared to 7.2% who were illiterate and an equivalent number who had earned postgraduate degrees [Masters/PhD]. This distribution reflects a reasonably mature and educated population with a strong representation of married indi- viduals and a noticeable proportion of higher education among participants.

Table 3: Overall medical staff service quality dimension

Table 3: Overall medical staff service quality dimension score in each domine						
	N	Minimum	Maximum	Mean	Std. Deviation	Variance
Reliability						
1. When the hospital promises to do something by a certain time it does so	320	1	5	2.62	0.716	0.513
2. When you have a problem, the hospital shows a sincere interest in solving it	320	1	4	2.37	0.688	0.473
3. The hospital gets things right the first time	320	1	5	2.47	0.738	0.545
4. The hospital insists on error-free records	320	1	5	2.52	0.747	0.558
Assurance						
1. The behaviour of personnel in the hospital instils confidence in you	320	1	5	2.42	0.763	0.582
2. You feel safe in your dealings with the hospital	320	1	5	2.39	0.784	0.614
3. Personnel in the hospital are consistently courteous with you	320	1	5	2.46	0.81	0.656
4. Personnel in the hospital have the knowledge to answer your questions	320	1	5	2.35	0.769	0.592
Tangibles						
1. The hospital has modern-looking equipment	320	1	5	2.39	0.785	0.616
2. The physical facilities in the hospital are visually appealing	320	1	5	2.38	0.831	0.69

3. Personnel in the hospital are neat in appear-ance	320	1	5	2.38	0.84	0.706
4. Materials associ- ated with the ser- vice (such as pamphlets or state- ments) are visually appeal- ing	320	1	5	2.51	0.834	0.696
Empathy						
1. The hospital gives you indi-vidual attention	320	1	5	2.55	0.844	0.713
2. The hospital has operating hours convenient to all its patients	320	1	5	2.5	0.842	0.708
3.the hospital has your best inter-ests at heart	320	1	5	2.51	0.768	0.589
4. The personnel of the hospital under- stand your specific needs	320	1	4	2.44	0.745	0.554
Responsiveness						
1. The personnel in the hospital tell you exactly when services will be per-formed	320	1	5	2.61	0.804	0.647
2. Personnel in the hospital gives you prompt service	320	1	5	2.46	0.791	0.626
3. Personnel in the hospital are always willing to help you	320	1	5	2.5	0.717	0.514
4. Personnel in the hospital are never be too busy to respond to your requests	320	1	5	2.53	0.783	0.614
Level of patient satisfaction in the hospital						
1.How satisfied are you with the over- all services provid- ed by the hospital	320	1	5	3.32	0.716	0.512

From the table 3 it shows that summary statistics from the survey responses shed light on patients' views regarding different aspects of service quality in the hospital. The mean scores across the five SERVQUAL dimensions—Reliability, Assurance, Tangibles, Empathy, and Responsiveness—varied from about 2.28 to 2.62 on a 1 to 5 scale, indicating a generally low to moderate level of satisfaction with the hospital's services.

Within the Reliability dimension, which assesses the hospital's capacity to reliably and accurately deliver promised services, mean scores were between 2.37 and 2.62, with the highest score suggesting the hospital is generally effective at meeting time commitments. This dimension has also been highlighted in other studies as foundational for patient satisfaction. Research in both Indian and international hospital settings has consistently shown that the perception of reliable, error-free, and trustworthy staff performance significantly raises over- all satisfaction levels [16, 17, 18]. Research by Simbo- lon et al. [2021] also [19] found that reliability was the most critical factor impacting patient loyalty and satisfaction, echoing the present study's results.

The Assurance dimension, relating to the professionalism and courtesy of the staff as well as their ability to instil trust, revealed mean scores ranging from 2.35 to 2.46, indicating that patients do not completely feel confident or secure when interacting with hospital staff, this may be because it is tertiary care teaching hospital, post graduate student of different specialities will be examining the patients. Arasli et al. [2005] in his study found that assurance significantly predicts patient confidence in hospital services, especially in public systems where trust deficits may exist.

In the Tangibles aspect, which pertains to the appearance of physical facilities, equipment, and staff, mean scores were among the lowest recorded, with the neatness of appearance and the visual appeal of the facilities receiving particularly unfavourable ratings, because few areas like parking and waiting lounge for ICU patient attenders are the concern by few patients. Earlier work by Bitner [1992] also highlighted that physical surroundings can influence emotional responses and perceived professionalism, reinforcing the idea that hospital design and visual cues matter most during early patient encounters. Studies by Hosseinzadeh et al. [2024] and Wulandari et al. [2024] show that while modern infrastructure and visually appealing environments contribute to positive expectations, it is the ongoing reliability, empathy, and responsiveness of staff that sustain long-term patient satisfaction. Interestingly, assurance and tangibles did not significantly predict patient satisfaction in the multivariate analysis.

Regarding Empathy, which evaluates the level of individualized attention and care provided to patients, scores ranged from 2.44 to 2.55. These figures imply that patients feel there is a deficiency in personalized care and attentiveness from the hospital staff, this may be because of huge volume of patient input and multitasking by healthcare professionals like clinical work, academics and research activities since it is tertiary care teaching hospital. Moniung [2014] in his study reported that empathy significantly predicted patient perceptions of quality in public hospitals, while Cunico et al. [2012] demonstrated that empathy skills among healthcare professionals positively shaped patient experiences and their satisfaction with clinical encounters.

The Responsiveness dimension, which measures the willingness and ability of staff to assist patients and deliver prompt service, showed slightly more favourable perceptions, with mean scores from 2.46 to 2.61; however, these figures remain below an ideal standard. This suggests that patients sense delays or a lack of eagerness in staff responsiveness. Parasuraman et al. first emphasized responsiveness as a core service quality dimension, highlighting its role in shaping consumer perceptions. Yu and Kirk in their study found that delays in communication and response are among the most common sources of patient dissatisfaction, while Griffith argued that responsiveness directly influences trust and the likelihood of patients recommending or returning to a facility.

Despite the overall moderate to low ratings across all ser-

vice quality dimensions, the overall patient satisfaction score was somewhat higher, with a mean of 3.32, indicat- ing that while patients acknowledge specific service qual- ity shortcomings, their overall satisfaction is relatively more positive—potentially influenced by factors not cap- tured by the SERVQUAL dimensions.

Table 4: Total medical staff services quality dimension scores		
Service dimensions	Mean	SD
Reliability	2.495	0.722
Assurance	2.405	0.7815
Tangibles	2.39	0.822
Empathy	2.5	0.799
Responsiveness	2.525	0.773
Level of patient satisfaction in the hospital	3.32	0.716

From the table 4 it shows that, the aggregated mean scores for the five SERVQUAL service dimensions reveal that Responsiveness [Mean = 2.525, SD = 0.773] and Empathy [Mean = 2.5, SD = 0.799] were rated slightly higher than the other dimensions, indicating patients found hospital staff relatively more willing to help and somewhat attentive to their individual needs. Reliability [Mean = 2.495, SD = 0.722] closely follows, suggesting moderate confidence in the hospital's ability to deliver services dependably.

However, Assurance [Mean = 2.405, SD = 0.782] and Tangibles [Mean = 2.39, SD = 0.822] received the lowest average ratings. This indicates a perceived lack of trust and confidence instilled by hospital personnel and dissatisfaction with the hospital's physical infrastructure, appearance, and equipment. The higher standard deviations, particularly in Tangibles and Assurance, reflect greater variability in patient perceptions, suggest - ing that experiences may differ significantly among individuals.

Interestingly, despite the generally low-to-moderate ratings across all service quality dimensions, the overall patient satisfaction score was considerably higher [Mean = 3.32, SD = 0.716]. This discrepancy implies that patients may weigh certain unmeasured factors— such as outcomes of care, staff empathy in critical moments, or prior expectations—more heavily when forming an overall satisfaction judgment.

Table 5: Correlation coefficient of the medical staff service quality dimensions with patient's level of satisfaction				
R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
.647a	0.419	0.41	0.55	1.556

From the table 5 it shows that; the regression analysis indicates a moderately strong positive correlation [R = 0.647] between service quality dimensions and overall patient satisfaction. The model explains approximately 41.9% of the variance in patient satisfaction [R² = 0.419], suggesting that service quality significantly in-

fluences how patients perceive their overall experience. The Adjusted R² of 0.410 confirms the model's reliability without being overfitted. A standard error of 0.55 indicates a moderate level of prediction error. The Dur- bin-Watson statistics of 1.556 suggests mild positive autocorrelation in the residuals, which is generally acceptable. Overall, the model is a fair predictor of patient satisfaction based on service quality dimensions.

Table 6: Significance value of medical staff services and quality dimensions with patient's level of satisfaction				
	Sum of Squares	df	Mean Square	F	Sig.
Regression	68.49	5	13.698	45.276	0
Residual	94.998	314	0.303		
Total	163.488	319			

From the table 6, the ANOVA table shows that the regres - sion analysis reveals that the model is statistically signifi - cant. The regression sum of squares [68.49] compared to the residual sum of squares [94.998] shows that a substan - tial portion of the total variance in patient satisfaction is explained by the model. The F-value of 45.276 with 5 degrees of freedom and a significance level [p-value] of 0.000 indicates that the model as a whole is highly signifi - cant. This means that at least one of the service quality dimensions [Reliability, Assurance, Tangibles, Empathy, or Responsiveness] significantly predicts overall patient satisfaction. Therefore, the regression model provides strong evidence that service quality dimensions collectively influence patient satisfaction in the hospital setting.

Table 7: Regression model							
	Unstandardized coefficients		Standardized coefficients			95.0% confidence interval for b	
	B	Std. Error	Beta	T	Sig.	Lower bound	Upper bound
(constant)	5.834	0.171		34.213	0	5.498	6.17
Reliability	-0.377	0.078	-0.273	-4.822	0	-0.53	-0.223
Assurance	-0.106	0.078	-0.086	1.369	0.172	-0.259	0.047
Tangibles	-0.081	0.072	-0.068	-1.137	0.256	-0.222	0.059
Empathy	-0.184	0.074	-0.15	-2.483	0.014	-0.329	-0.038
Responsiveness	-0.264	0.078	-0.214	-3.39	0.001	-0.417	-0.111

From the table 7 the regression coefficients table it provides detailed insights into the influence of each service

quality dimension on patient satisfaction. The model's constant is 5.834, indicating the baseline satisfaction level when all predictors are zero. Among the predictors, Relia- bility [B = -0.377, p < 0.001], Empathy [B = -0.184, p = 0.014], and Responsiveness [B = -0.264, p = 0.001] have statistically significant negative coefficients, suggesting that as patients' negative perceptions of these dimensions increase, overall satisfaction decreases. However, Assur- ance [p = 0.172] and Tangibles [p = 0.256] do not significantly predict satisfaction, as their p-values exceed 0.05 and their confidence intervals include zero. Notably, all significant predictors have negative coefficients, which may indicate that lower scores [possibly reflecting bet- ter experiences on a reversed scale] are associated with higher satisfaction. These results highlight improve- ments in reliability, empathy, and responsiveness are particularly critical for enhancing patient satisfaction in the hospital.

CONCLUSIONS

This study confirms that service quality dimensions, particularly reliability, empathy, and responsiveness, have a significant influence on patient satisfaction in hospital settings. Although patients reported moderate satisfaction with service quality overall, their general satisfaction levels were slightly higher, suggesting that evaluative processes extend beyond tangible factors. Assurance and tangibles, while contributing to the patient experience, did not significantly predict satisfaction, highlighting the predominance of interpersonal and procedural aspects of care.

Recommendations

Based on these insights, the following recommendations are proposed for hospital administrators and healthcare providers [2, 5, 8, 9, 21, 22, 23, 24, 25, 26, 27]:

Hospitals can improve service quality and patient satisfaction by focusing on core improvement areas. Strengthening reliability through standardized protocols, coordinated workflows, and strong quality assurance helps reduce errors and ensures consistent service. En- hancing empathy with targeted staff training in commu- nication, cultural competency, and patient-centred care fosters a compassionate environment. Improving re- sponsiveness by optimizing staff-patient ratios, stream- lining processes, and using real-time communication tools reduces delays. Regular monitoring with SERV- QUAL and other feedback mechanisms helps identify gaps and track progress. Aligning marketing with actual service capacity promotes transparency and avoids over- promising, while investing in staff support, supervision, and motivation maintains a committed workforce. To- gether, these measures enhance patient satisfaction, clin- ical outcomes, loyalty, and overall hospital reputation.

Limitations of the Study

Limitations of this study include the reliance on cross-sectional data, which precludes establishing causal relationships, and context-specific factors, such as local culture or hospital management style, that may limit the generalizability of the findings. The use of convenience sampling may introduce selection bias. Additionally, reliance on self-reported perceptions may be affected by factors such as mood, expectations, or cultural norms.

Future research should consider longitudinal or mixed methods approaches to gain a deeper understanding of evolving perceptions and to incorporate qualitative feedback.

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