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Supporting Service Quality and Patient Satisfaction in Tertiary Multispecialty Hospitals: Evidence from Bengaluru, India

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Abstract: Supporting services form an important part of the patient experience, although healthcare-quality research frequently gives greater attention to medical and nursing care. This study examined the contribution of hospital supporting services to patient satisfaction in selected tertiary multispecialty hospitals in Bengaluru, India. A quantitative, cross-sectional design was adopted. Data were collected from 400 adult patients drawn equally from four hospitals using a structured questionnaire. Supporting services were assessed through the availability of prescribed medicines, laundry and linen services, laboratory affordability, diagnostic turnaround time, hospital food, hygienic practices, ambulance and parking facilities, and ward or room maintenance. Patient satisfaction was measured using a multi-item scale. The proposed relationship was tested using multiple linear regression. The results demonstrated a moderately strong positive relationship between the retained supporting-service attributes and patient satisfaction (R=.645). The model explained 41.6% of the variance in patient satisfaction (R^2 = .416, adjusted R^2 = .406) and was statistically significant, F7392=39.879, p<.001. The findings indicate that patients' evaluations extend beyond clinical encounters to the reliability, accessibility, cleanliness, timeliness and convenience of ancillary hospital services. Hospitals should therefore integrate supporting-service performance into patient-experience and quality-improvement programmes. Regular monitoring of pharmacy availability, diagnostic turnaround times, environmental hygiene, linen quality and patient amenities may strengthen overall satisfaction. The study extends healthcare service-quality literature by drawing attention to the operational services surrounding clinical care in a metropolitan Indian healthcare context.

Keywords: supporting services, patient satisfaction, hospital service quality, diagnostic services, hospital hygiene, tertiary hospitals.

1. Introduction

Healthcare quality is no longer assessed exclusively through clinical effectiveness, treatment outcomes or professional competence. Patients encounter a network of clinical, administrative and operational services throughout their hospital journey. Their satisfaction may therefore depend not only on doctors and nurses but also on whether medicines are available, diagnostic tests are completed promptly, laboratory charges are perceived as reasonable, rooms are clean, linen is properly maintained and essential facilities are accessible.

The World Health Organization identifies effectiveness, safety, people-centredness, timeliness, equity, integration and efficiency as the defining characteristics of quality healthcare. These characteristics require coordination between clinical care and the services that support it. A clinically appropriate treatment plan may still produce an unfavourable patient experience when prescribed medicines are unavailable, diagnostic reports are delayed, hygiene is inadequate or patient rooms are poorly maintained (*World Health Organization, 2025*).

Patient satisfaction represents an evaluative response to the healthcare received in relation to patients' expectations, preferences and perceived needs. It is multidimensional because patients interact with medical personnel, diagnostic units, pharmacies, laboratories, dietary departments, sanitation workers, transport facilities and administrative systems. Satisfaction consequently reflects the cumulative experience created by the entire service-delivery system rather than an isolated clinical encounter.

Supporting services refer to the operational and ancillary

facilities that enable clinical care to be delivered safely, efficiently and comfortably. Medicine availability facilitates treatment continuity. Laboratory and diagnostic services support timely clinical decisions. Laundry, linen, sanitation and room-maintenance services create a safe and dignified treatment environment. Hospital food contributes to nutrition and inpatient comfort, while ambulance and parking facilities affect physical accessibility. These services may not constitute direct clinical treatment, but their absence or poor performance can interrupt the treatment process and diminish patients' confidence in the hospital.

Donabedian's (1988) structure–process–outcome framework provides a suitable theoretical foundation for examining these services. Medicine stocks, diagnostic equipment, ambulance facilities and physical infrastructure represent structural resources. The timeliness of diagnostics, provision of clean linen and maintenance of hygiene represent service processes. Patient satisfaction constitutes a patient-reported outcome arising from exposure to these structures and processes.

Previous research has established healthcare service quality as a major determinant of patient satisfaction. *Batbaatar et al. (2017)* found that service-quality indicators were among the most consistent predictors of satisfaction. Research from Asian healthcare settings has similarly identified accessibility, affordability, waiting time, technical services, physical environment and provider-related characteristics as important antecedents of patient evaluations *(Akthar et al., 2023).* Nevertheless, existing studies often combine supporting services with broader dimensions such as tangibility or operational quality. This makes it difficult to understand the collective contribution of supporting services to satisfaction.

The present study addresses this issue by examining supporting services as a distinct component of healthcare service quality. It focuses on medicine availability, laundry and linen, laboratory facilities, diagnostic timeliness, hospital food, hygienic care, ambulance and parking facilities, and ward or room maintenance. The study seeks to determine whether these attributes collectively predict patient satisfaction in tertiary multispecialty hospitals in Bengaluru.

Research objective: To examine the contribution of hospital supporting-service attributes to patient satisfaction in selected tertiary multispecialty hospitals in Bengaluru.

Hypothesis:H1c: Hospital supporting services positively predict patient satisfaction.

2. Literature Review

2.1. Patient satisfaction and healthcare quality

Patient satisfaction is widely used as a patient-reported indicator of healthcare quality. It reflects how patients evaluate service delivery after comparing their experiences with prior expectations and perceived needs. Satisfaction is influenced by clinical effectiveness, interpersonal treatment, accessibility, physical facilities, waiting time, communication and service convenience.

Patients are generally unable to evaluate every technical aspect of clinical care. They therefore rely on visible and experiential cues when judging quality. The availability of medicines, speed of diagnostic services, cleanliness of rooms and accessibility of hospital facilities provide observable evidence about institutional organisation and reliability. Supporting services may consequently influence both satisfaction and patients' broader confidence in the hospital.

Donabedian (1988) proposed that healthcare quality should be examined through structure, process and outcome. Within this framework, hospital facilities, equipment and human resources constitute structure; service delivery represents process; and patient satisfaction is one of the outcomes. Supporting services connect these components because they transform hospital resources into experiences that patients can directly observe.

Service-quality theory also explains this relationship. *Parasuraman et al. (1988)* identified reliability, responsiveness, assurance, empathy and tangibility as central dimensions of perceived service quality. Supporting services reflect reliability when medicines and diagnostic facilities are consistently available, responsiveness when reports are delivered promptly, and tangibility when rooms, linen and equipment are properly maintained.

2.2. Availability of medicines

Access to prescribed medicines is essential for treatment continuity. When hospital pharmacies maintain adequate stocks, patients can initiate treatment without visiting multiple external providers. Medicine availability also reduces travel, waiting, uncertainty and additional expenditure.

The absence of required medicines may cause treatment delays and weaken patients' perceptions of institutional preparedness. Pharmacy availability is therefore more than a retail convenience: it forms part of the hospital's continuity-of-care system. Patients are likely to evaluate hospitals more favourably when prescribed medicines are consistently available, clearly labelled and delivered without excessive waiting.

2.3. Laboratory affordability and diagnostic timeliness

Laboratory and diagnostic services support diagnosis, treatment planning and clinical monitoring. Their quality is judged not only by technical accuracy but also by affordability, accessibility and turnaround time. Patients may experience anxiety when tests are delayed or when the process of obtaining reports is unclear.

Waiting time has received increased attention as an important patient-centred performance indicator *(Loving et al., 2017).* Lengthy diagnostic delays can extend the hospital visit, postpone treatment decisions and create perceptions of poor coordination. By contrast, timely testing and reporting signal operational responsiveness.

Affordability is particularly relevant in healthcare systems where patients make substantial direct payments. Even technically advanced laboratory services may be evaluated unfavourably when charges are perceived as excessive or inadequately explained. Patients' evaluations therefore reflect the

interaction between technical quality, cost and service convenience.

2.4. Laundry, linen and hygienic care

Clean linen, hygienic procedures and proper environmental maintenance communicate safety, dignity and organisational discipline. Hospital cleanliness is a readily observable quality signal that may shape patients' impressions before they can assess clinical outcomes.

Laundry and linen services are particularly important for inpatients, who remain in direct contact with bedding, gowns and room facilities. Poorly maintained linen may create discomfort and concerns about infection control. Hygienic practices similarly influence whether patients perceive the hospital as safe and professionally managed.

Environmental cleanliness is not merely an aesthetic concern. It is closely connected with patient safety, infection prevention and the credibility of institutional quality systems. Hospitals should therefore regard sanitation, linen management and environmental services as integral components of care delivery.

2.5. Hospital food services

Hospital food contributes to patient nutrition, recovery and comfort. Patients evaluate food through taste, temperature, variety, presentation, dietary suitability, serving time and staff behaviour. A systematic review by *Dall'Oglio et al. (2015)* found that food quality, meal-service characteristics and patient expectations were important elements of satisfaction with hospital food services.

Food satisfaction can be affected by illness, medication, appetite and dietary restrictions. Consequently, low food ratings do not always indicate operational failure. Nevertheless, meal quality and responsiveness to dietary requirements remain meaningful aspects of the inpatient experience. Recent research continues to show that patients distinguish between food quality and the quality of staff and meal delivery services *(Rapo et al., 2021).*

2.6. Ambulance and parking facilities

Accessibility begins before patients enter the hospital. Ambulance services facilitate urgent and planned transportation, while adequate parking reduces inconvenience for patients and accompanying family members. In metropolitan areas such as Bengaluru, traffic congestion and limited parking may add stress to an already demanding healthcare visit.

Ambulance availability may also contribute to perceptions of institutional readiness and continuity of care. Parking is less clinically significant but can influence convenience, particularly for older patients, people with disabilities and families attending repeated appointments. These facilities demonstrate that patient experience begins at the point of access rather than at the consultation room.

2.7. Ward and room maintenance

The condition of wards and rooms affects comfort, privacy, safety and confidence in the hospital. Maintenance includes cleanliness, ventilation, lighting, functional equipment, washroom condition, waste disposal and timely attention to repairs. A well-maintained environment signals that the hospital exercises control over its operational processes.

Physical surroundings may also affect emotional well-being. Patients often experience vulnerability, anxiety and uncertainty during hospitalisation. A clean, quiet and properly maintained environment can reduce discomfort, whereas damaged facilities or poor sanitation can intensify dissatisfaction.

2.8. Research gap and hypothesis development

Existing studies confirm that healthcare service quality influences patient satisfaction, but attention remains concentrated on physician communication, nursing care and clinical outcomes. Supporting services are frequently included under broad labels such as tangibility or infrastructure, limiting the ability to understand their collective explanatory contribution.

Evidence from Asian healthcare settings indicates that physical environment, service accessibility, affordability, waiting time and operational organisation contribute to patient satisfaction *(Akthar et al., 2023).* However, their combined effect requires further investigation in large metropolitan private hospitals. The present study therefore examines whether selected supporting-service attributes collectively predict patient satisfaction.

Based on Donabedian's structure–process–outcome framework and service-quality theory, it is proposed that reliable, accessible, timely and hygienic supporting services create a more favourable hospital experience. Accordingly, H1c predicts a positive relationship between supporting services and patient satisfaction.

3. Materials and Methods

3.1. Participants and procedures

The study used a quantitative, cross-sectional survey design. Data were collected as part of a doctoral dissertation after obtaining approval from the Doctoral Review Committee of [university name]. Administrative permission was obtained from the participating hospitals, and relevant ethical requirements were observed.

The study was conducted in four prominent tertiary multispecialty hospitals in Bengaluru: Manipal Hospital, Old Airport Road; Apollo Hospitals, Bannerghatta Road; Fortis Hospital, Bannerghatta Road; and Aster CMI Hospital, Hebbal. The hospitals were purposively selected based on their tertiary-care status, breadth of medical services, patient volume and accessibility.

The study population comprised adult patients who had received outpatient or inpatient services from one of the selected hospitals. Participants were required to be at least 18 years old,

medically stable and able to evaluate the supporting services they had encountered. Patients receiving emergency or critical care, individuals unable to respond independently, and attendants who had not personally received hospital services were excluded.

A sample of 400 patients was selected, with 100 respondents drawn from each hospital. Systematic intercept sampling was applied within outpatient waiting areas and inpatient discharge units. Data collection was distributed across different days and service periods to minimise temporal selection bias.

Before participation, respondents received information about the study and provided informed consent. They were informed that participation was voluntary, withdrawal was permitted at any time, and their decision would not affect the healthcare services received. No personally identifiable or clinical information was recorded. Responses were used exclusively for academic purposes and reported in aggregate form.

3.2. Measures

A structured, self-reported questionnaire was used. The instrument comprised demographic questions, supporting-service attributes, and patient-satisfaction items. Substantive statements were measured on a five-point Likert scale ranging from 1, "strongly disagree," to 5, "strongly agree."

The questionnaire was reviewed by experts in healthcare management, hospital administration, and research methodology. It was pilot-tested among 40 patients from a hospital excluded from the main study. The English questionnaire was translated into Kannada and independently back-translated to establish conceptual equivalence.

3.3. Supporting services

Supporting services were measured through the following statements: The attributes were conceptualized as distinct observed predictors because they represented different operational aspects of hospital service delivery.

3.4. Patient satisfaction

Patient satisfaction was measured using five items adapted from healthcare satisfaction literature.

4. Result and Discussion

A total of four statements are considered for the Supporting Service for the study.

- Availability of Required Medicines
- Laundry and linen services
- Good lab facilities at affordable prices a
- Minimum time Diagnostics services
- Hospital provided good food
- Hygienic care and procedures
- Ambulance, parking facilities
- Maintenance of ward/room
- Y1 Patient satisfaction

As the statements of the Supporting Service (independent variables) are multiple and an outcome (dependent) variable is single, multiple regression analysis is used to test the prediction of patient satisfaction through Supporting Service. So, the hypothesis is framed as

4.1. H1c: Supporting Service positively influences Patient

- **satisfaction**: Here, statements of Supporting Service are treated as an independent variable, and Patient satisfaction is treated as a dependent variable. The results of the multiple linear regression are presented below.
- **Model Estimation** :The results of the regression model summary are presented in Table 1.

Table 1: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.645[a]	.416	.406	.863

a. Predictors: (Constant), VSM7, VSM1, VSM6, VSM4, VSM3, VSM5, VSM2

R value explains the quality of the prediction of the independent variables about the dependent variable. The R value (0.668) signifies the positive relationship between Supporting Service and Patient satisfaction. R2 value describes the explanatory power of the independent variables about the dependent variable. It reports the variance that results in the dependent variable due to all the predictors of the model. The resulting R^2 value of 0.446 indicates that nearly 44.6% (0.446 X 100) of patient satisfaction (dependent variable) in the model was derived from Supporting Service (independent) variables.

4.2. Model Validity and Usefulness

The results of the regression model ANOVA are presented in Table 2.

Table 2: ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	207.863	7	29.695	39.879	.000[b]
	Residual	291.887	392	.745		
	Total	499.750	399			

a. Dependent Variable: GS1

b. Predictors: (Constant), VSM7, VSM1, VSM6, VSM4, VSM3, VSM5, VSM2

F and significance values in the regression model describe the overall model significance and model fit. The F-value 136.531 is high (not close to 1), and the p-value 0.000 is less than 0.05, indicating that the regression model for predicting Patient satisfaction through Supporting Service is a good fit. It can be declared that the regression model is useful in predicting Patient satisfaction in the study location.

4.3. Prediction

Each factor of Supporting Service contributes to predicting Patient satisfaction, as stated in table 3.From Table 3, it is found that three variables under Supporting Service are significant

out of the total four variables. The p-values for the variables, reference books (0.000), textbooks (0.000), and Novel or poetry stuff (0.000) are less than 0.05. Hence, these three variables are contributing to patient satisfaction.

To find out the strength of the prediction of these three variables, the concerned standardized regression coefficient beta values in Table 3 are examined. The following figure depicts the overall contribution of the reference books, textbooks, and novel or poetry books towards the Patient satisfaction of the street vendors.

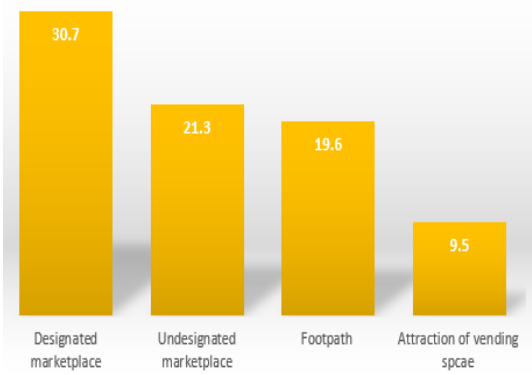

Figure 1: Supporting Service contribution in patient satisfaction

The beta values for reference books (0.337), textbooks (0.311), and novels or poetry (0.204) are proven as significant contributors towards street vendors' Patient satisfaction. It means that a 100% improvement in the provision of reference books, textbooks, and novels in the library enhances the street vendor's Patient satisfaction by 33.7%, 31.1%, and 20.4%, respectively.

The chapter explored the Healthcare Service Quality of Patients dimensions through the exploratory factor analysis. 45 items were grouped into seven dimensions Medical Services, nursing services, supporting service administrative services, patient safety measures, patient communication, and healthcare infrastructure. The explored items comprise reliability and validity. Later descriptive analysis was carried out and found that three factors reaped positive reactions from the Patients out of seven factors.

Multiple regression analysis is carried to assess the contribution of Patient's Healthcare Service Quality dimensions on Patient satisfaction. Items like Assessment of customer preferences (82.3%), Hygienic preparation of products (66.8), Quick Assessment of changing market trends (50.4) etc contribute towards the Patient satisfaction to the maximum extent. Concerned 7 hypotheses are supported.

Table 3: Regression coefficients

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	.917	.231		3.964	.000
Designated marketplace allotment	.299	.056	.307	5.369	.000
Undesignated marketplace allotment	.210	.064	.213	3.272	.001
Footpath allotment	.201	.066	.196	3.063	.002
Vend at high customer footfall	-.018	.076	-.013	-.240	.811
Vending space maintenance	-.039	.083	-.025	-.467	.641
Nearby shop owners' support	-.003	.081	-.002	-.056	.955
Attraction of vending space	.134	.064	.095	2.101	.036

a. Dependent Variable: SS

5. Practical and Theoretical Implications

5.1. Theoretical implications

The findings support the proposition that patient satisfaction is shaped by a broader service system extending beyond direct medical and nursing care. The retained supporting-service variables explained 41.6% of the variance in patient satisfaction, demonstrating their considerable explanatory relevance.

The findings extend Donabedian's structure–process–outcome framework by illustrating how structural resources and operational processes contribute to patient-reported outcomes. Supporting services should therefore not be treated merely as background facilities. They constitute observable evidence through which patients assess institutional reliability, responsiveness and quality.

The study also strengthens the application of service-quality theory in healthcare. Medicine availability and dependable laboratory services represent reliability; diagnostic speed reflects responsiveness; and cleanliness, linen quality and room maintenance represent the tangible dimension of service quality.

5.2. Managerial implications

Hospital managers should incorporate supporting-service indicators into routine patient-experience monitoring. Clinical departments cannot independently deliver a satisfactory experience when pharmacy, diagnostic, sanitation and facility-management systems are poorly coordinated.

Pharmacy departments should monitor stock-out rates for commonly prescribed medicines and develop arrangements for rapid replenishment. Hospitals should also communicate medicine availability clearly to reduce unnecessary patient movement.

Diagnostic departments should establish and publish expected turnaround times for commonly requested tests. Delays should be monitored through real-time dashboards, and patients should receive updates when reports cannot be delivered within the promised period.

Environmental-service audits should assess ward cleanli-

ness, washroom conditions, linen replacement, waste disposal and adherence to hygiene protocols. Cleanliness data should be combined with patient feedback rather than relying entirely on internal inspections.

Hospital dietary departments should periodically assess food temperature, taste, dietary appropriateness, serving time and patient preferences. Food-service evaluations should distinguish between food quality and service-delivery quality because they may require different interventions.

Ambulance availability, parking convenience and accessibility arrangements should be included in broader patient-journey assessments. Patient experience begins before registration and continues after discharge; consequently, transportation and access facilities should not be excluded from quality planning.

5.3. Policy implications

Healthcare accreditation and quality-assurance systems should include measurable standards for supporting services. Performance indicators may include pharmacy stock availability, diagnostic turnaround time, linen replacement frequency, environmental audit scores, food-service satisfaction and ambulance response time.

Patient-reported experience measures should be collected regularly and reported at departmental level. However, such measures should be interpreted alongside safety, clinical and operational indicators rather than being treated as substitutes for technical quality.

6. Conclusion

The study demonstrates that supporting services are an important component of the hospital experience. The retained supporting-service attributes showed a moderately strong relationship with patient satisfaction and collectively explained 41.6% of its variance. The overall regression model was statistically significant, supporting the hypothesis that supporting services positively predict patient satisfaction.

These findings emphasise that patients judge hospitals through the complete service environment surrounding clinical care. The availability of medicines, timely and affordable diagnostics, clean linen, appropriate food, hygienic procedures, transportation facilities and properly maintained rooms can strengthen the perceived reliability and responsiveness of a hospital.

Tertiary hospitals should therefore manage supporting services as an integrated component of healthcare quality rather than as peripheral operational functions. Investments in clinical expertise may not produce the expected patient experience unless they are supported by accessible, timely, hygienic and dependable ancillary services.

The cross-sectional design limits causal conclusions, while equal allocation across four purposively selected private hospitals limits generalisation to other healthcare settings. Future research could employ longitudinal designs, include public and rural hospitals, and compare inpatient and outpatient evaluations. Structural equation modelling could also be used to investigate whether perceived service quality, trust or perceived value mediates the relationship between supporting services and patient satisfaction.

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