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Evaluating Patient-Centered Care in Tertiary Hospitals: Insights from the Picker Patient Experience Model

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ABSTRACT

Patient-centered care has emerged as a critical determinant of healthcare quality and organizational performance in emerging economies such as Pakistan, where tertiary healthcare institutions face substantial operational, infrastructural, and resource constraints. This study aimed to investigate the influence of the Picker Patient Experience (PPE) Model dimensions on overall patient satisfaction, while examining the mediating role of perceived service quality in tertiary care hospitals in Karachi. A quantitative, cross-sectional, and non-experimental research design was employed. Sample size was 272. A structured questionnaire on a five-point Likert scale was used. Partial Least Squares Structural Equation Modelling was run to assess the hypothesized relationships among constructs. Findings indicate that coordination of care was negatively associated with overall patient satisfaction, although it was positively associated with perceived service quality. In contrast, emotional support, information and education, and physical comfort significantly and positively influenced both perceived service quality and overall patient satisfaction, with physical comfort emerging as the strongest predictor. Furthermore, perceived service quality exerted a significant positive effect on overall patient satisfaction, confirming its mediating role within the proposed framework. However, continuity and transition, involvement of family and friends, and respect for patient preferences did not produce statistically significant relationships with either perceived service quality or overall patient satisfaction. The findings provide valuable insights for healthcare managers and policymakers to enhance service delivery, optimize patient-centered care practices, and improve patient satisfaction outcomes in tertiary care settings.

Keywords: Patient-Centered Care, Patient Satisfaction, Picker Patient Experience (PPE) Model, Perceived Service Quality, Healthcare Management, Tertiary Care Hospitals.

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INTRODUCTION

The healthcare sector is playing a pivotal role in improving the public well-being and the provision of patient-centric services. Service quality is a significant factor in organizational performance and patient outcomes in modern healthcare systems. Beyond treating patients, healthcare institutions are supposed to offer services that lead to positive patient experiences, while also adhering to quality standards (Ahmad *et al*., 2023; Chen *et al*., 2024). Therefore, patient satisfaction is an important indicator for assessing the quality of healthcare, reflecting patients' perceptions, expectations, and experiences of healthcare encounters (Li *et al*., 2023).

Patient satisfaction is related to perceived service quality. It has a considerable influence on patients' trust, comfort, and willingness to return to healthcare providers. It refers to the patients' evaluation of the healthcare services based on their expectations and actual experiences (Rane *et al*., 2024). Research has demonstrated that perceived service quality is positively correlated with patient satisfaction and improved healthcare outcomes. In this way, the Picker Patient Experience Model offers a holistic framework for understanding patient-centered care, with a focus on dimensions such as respect, communication, emotional support, and responsiveness to patient needs (Kumpf *et al*., 2023). These dimensions are important for assessing the quality of health care services and for strengthening the long-term relationships of health care providers and their patients.

Despite the growing importance of patient satisfaction, existing literature has mainly focused on the quality of general healthcare services and has not specifically investigated the mediating role of perceived service quality on patient satisfaction. Past research has largely focused on broad organizational variables such as employee satisfaction and operational efficiency and their relationships with patient satisfaction (Chen *et al*., 2024). This has limited a focused understanding of patient-oriented healthcare outcomes. Moreover, most of the empirical research has been conducted in the developed countries, which have healthcare systems very different from those in developing countries such as Pakistan (Rane *et al*., 2024). Therefore, the available results can be generalized to tertiary care hospitals in Pakistan to some extent.

The emerging economies face unique operational and resource-related challenges in the healthcare system that directly affect service quality and patient experiences (Ahmad *et al*., 2024). However, the literature in this regard offers limited research related to the dynamics within the Pakistani healthcare context. Therefore, this study intended to address an important gap in the literature by applying the Picker Patient Experience Model to study how perceived service quality influences patient satisfaction in tertiary care hospitals in Pakistan. By isolating patient-centric dimensions from broader organizational operations issues, the study extends the understanding to further explore how healthcare service quality and offers practical insights for improving patient experiences and healthcare delivery in developing countries. Therefore, the objective of this study is to explore the patient satisfaction level in the tertiary care hospitals in the resource-constrained emerging economy of Pakistan, using the Picker Patient Experience (PPE) Model. It was also intended to investigate the impact of the PPE Model on patient satisfaction under the mediating influence of perceived service quality.

SCOPE OF THE STUDY

This study is designed to determine patient satisfaction in tertiary care hospitals of Karachi by using the Picker Patient Experience Model. The study examines the link between patient satisfaction and perceived service quality, highlighting key aspects of patient-centered care such as respect, communication, and participation in care decisions. This study focuses on patient-oriented aspects of healthcare services, excluding such factors as employee satisfaction and organizational efficiency. It only involves patients receiving or recently receiving treatment in tertiary care hospitals and excludes primary and secondary healthcare settings. The findings offer practical insights for enhancing health care service delivery and patient experiences in Pakistan.

LITERATURE REVIEW

Perceived Service Quality, SERVQUAL, and Patient Satisfaction

Patient perceived value (see Baig *et al*., 2023; Irfan & Baig, 2023), a central theme in the quality of healthcare delivery SERVQUAL (Parasuraman *et al*., 1988), is the widely used model designed to measure service quality by examining the gap between customer expectations and perceptions of actual service delivery. This model is used to identify five key dimensions of service quality - namely, reliability, assurance, tangibles, empathy, and responsiveness (RATER). Reliability is defined as how consistently and dependably service delivery takes place, assurance refers to the staff competence and trustworthiness, tangibles refer to the physical facilities and equipment, empathy relates to personalized care and understanding of customer needs, and responsiveness includes the prompt assistance and willingness to help (Abari *et al*., 2011). Hoque *et al*. (2023) defined perceived service quality in healthcare as how patients make an evaluation of healthcare overall services based on their expectations and experiences. According to the SERVQUAL framework, higher perceived service quality occurs when healthcare services meet or exceed patient expectations. Patient satisfaction, therefore, reflects the extent to which healthcare services fulfill patient needs and expectations through quality treatment, effective communication, accessibility, and supportive care environments (Rivero *et al*., 2023). Consequently, improving perceived service quality enhances patient satisfaction, trust, and overall healthcare experiences.

Picker Patient Experience Model

In the early 1980, the Picker Institute developed the Picker Patient Experience Model developed by the Picker Institute to promote patient-centered care and improve healthcare experiences. This model's main emphasis rests on the patients' needs, expectations, and experiences throughout their healthcare journey (Jenkinson, Coulter, Gyll, *et al*., 2002). It has been widely used to assess healthcare quality, as it identifies areas requiring improvement across healthcare organizations (Leonardsen *et al*., 2017). There are seven dimensions of this model, including: continuity and transition, coordination of care, emotional support, involvement of family and friends, information and education, respect for patient preferences, and physical comfort. Importantly, these dimensions address the clinical and emotional aspects alike concerning patient care, recognizing that healthcare quality extends beyond medical treatment to include psychological well-being and patient satisfaction (Buclin *et al*., 2024).

Continuity and Transition

Continuity and transition are defined as the smooth delivery of healthcare services as patients move between healthcare providers or facilities. This dimension recognizes the importance of effective communication, documentation, and follow-up care to minimize disruptions and ensure that patients remain informed throughout the treatment process. An effective continuity of care lowers treatment gaps reduces the risk of adverse outcomes, and promotes patient satisfaction (Pateman *et al*., 2023).

Coordination of Care

Coordination of care is defined as the organization of healthcare services so that patients receive timely and appropriate treatment without duplication of services. It focuses on collaboration among healthcare professionals across primary, specialty, and acute care settings. Effective coordination ensures patient safety, enhances service efficiency, and reduces errors in healthcare delivery (Lopez-Ibort *et al*., 2024).

Emotional Support

Emotional support focuses on patients' psychological and emotional needs during healthcare treatment. It helps reduce a Patient's experience of stress, anxiety, and fear during illness, making empathy, trust, and attentiveness essential components of quality care. Providing emotional support makes the patients feel valued and respected, contributing positively to recovery and overall healthcare experiences (Pateman *et al*., 2023).

Involvement of Family and Friends

This dimension focuses on the role of family and friends in supporting patients emotionally, physically, and logistically throughout the treatment process. Their involvement in healthcare decisions and care transitions improves patient confidence, treatment adherence, and reduces fatigue and satisfaction. It also strengthens communication between healthcare providers and caregivers, reducing the likelihood of readmissions and improving overall healthcare outcomes (Buclin *et al*., 2024).

Information and Education

Information and education are about providing patients with accurate, timely, and understandable information regarding their medical conditions, treatment options, and care plans. An adequate patient education encourages informed decision-making, improves adherence to treatment recommendations-implementation, and enhances overall patient outcomes and experiences (Adams *et al*., 2024).

Respect for Patient Preferences

Respect for patient preferences enhances positive outcomes as the healthcare providers consider patients' values, beliefs, cultural backgrounds, and personal choices during treatment. Making the patients involved in decision-making promotes trust, dignity, and a sense of control, ultimately improving patient satisfaction and healthcare experiences (Avlijas *et al*., 2023).

Physical Comfort

Physical comfort helps minimize pain and discomfort during healthcare treatment. The typical comforting variables include pain management, cleanliness, mobility, rest, and nutritional support. As these physical needs are addressed, it contributes significantly to patient well-being and create a more positive patient experience (Reid *et al*., 2024)

HYPOTHESES DEVELOPMENT

Perceived Service Quality and Overall Patient Satisfaction

The extant literature showed that perceived service quality is an important aspect of overall satisfaction amongst patients in a healthcare organization (Baig *et al*., 2023; Irfan & Baig, 2023; Siddiqui & Baig, 2024; Emon *et al*., 2023). It encompasses the patients' perception of several service qualities, including time responsiveness, courtesy, communication, knowledge, and physical comfort in the facilities. The perceived service quality rises as healthcare providers meet or exceed expectations through professional and patient-centric practices, clear communication, and a clean environment (Grossu-Leibovica & Kalkis, 2023). Patient satisfaction involves a holistic assessment of healthcare experience based on expectations, emotions, and prior encounters (Darzi *et al*., 2023). Prior studies consistently confirm a strong positive association between perceived service quality and patient satisfaction, indicating that improvements in service quality enhance satisfaction levels (Kalaja, 2023). Hence, the hypothesis may be formed:

H_1: A significantly positive relationship exists between perceived service quality and overall patient satisfaction.

Continuity and Transition and Perceived Service Quality

Continuity and transition are the major aspects of a healthcare delivery system that enhance perceived service quality. The continuity ensures coordinated care across different processes, while transition involves movement between providers or settings (Sun *et al*., 2023). Evidence suggests continuity and transition significantly promote perceived service quality (Bourne *et al*., 2023; Pateman *et al*., 2023). Smooth transitions during referrals or discharge increase patient confidence (Buclin *et al*., 2024), while discontinuity leads to confusion and trust is reduced. Effective communication enhances care pathways and reduces errors (Pateman *et al*., 2023). The revisit intention of the patient is increased with the perceived high value of the care provided (Baig *et al*., 2023). Hence, the hypothesis has been established:

H_2: A significantly positive relationship exists between continuity and transition and perceived service quality.

Coordination of Care and Perceived Service Quality

Care coordination is defined as the integration of services across providers for efficient healthcare delivery (Khatri *et al*., 2023). Patients assess service quality based on their experiences related to collaboration among healthcare professionals (Chen *et al*., 2023). The time a patient spends with a doctor(Irfan & Baig, 2023) improves the coordination between the patient and the doctor. Bad coordination leads to duplication, delays, and dissatisfaction among the patients (Agerholm *et al*., 2023). Integrated care models improve efficiency and trust (Akthar *et al*., 2023), leading to the development of the hypothesis:

H3: There is a significantly positive relationship between care coordination and perceived service quality.

Emotional Support and Perceived Service Quality

Emotional support is a fundamental aspect of perceived service quality when it comes to treating patients (Mehnert-Theuerkauf *et al*., 2023). It involves empathy, listening, and reassurance, reducing stress and improving trust (Akthar *et al*., 2023). Studies show a strong positive relationship between emotional support and perceived service quality (Chen *et al*., 2023; Kalaja, 2023). It improves communication and engagement (Khatri *et al*., 2023). Hence, the hypothesis has formed:

H_4: There is a significantly positive relationship between emotional support and perceived service quality.

Involvement of Family and Friends and Perceived Service Quality

Another important determinant of the perceived quality is the psychological support given to the patient by involving their family and friends (Mehnert-Theuerkauf *et al*., 2023). It helps improve communication and treatment plan implementation (Kalaja, 2023). Previous research confirms a positive relationship between family involvement and perceived service quality (Chen *et al*., 2023). Not involving the loved ones of the patient may reduce satisfaction (Sun *et al*., 2023). Thus, the hypothesis has formed:

H_5: There is a significantly positive relationship between the involvement of family and friends and perceived service quality.

Information, Education, and Perceived Service Quality

In Pakistan, this aspect remains important to satisfy patients. Information and education improve understanding of disease and treatment, promoting perceived service quality (Emon *et al*., 2023). Effective communication establishes trust and reduces anxiety (Haryaningsih *et al*., 2023). Studies show a strong positive relationship between information provision and perceived service quality (Kalaja, 2023). Ineffective communication leads to dissatisfaction (Chen *et al*., 2023). Hence, the hypothesis may be formed:

H_6: There is a significantly positive relationship between information and education and perceived service quality.

Respect for Patient Preferences and Perceived Service Quality

Respect for patient preferences is like a focal point of patient-centered care. It enhances perceived service quality (Emon *et al*., 2023). Shared decision-making promotes trust (Kalaja, 2023). Lack of respect undermines satisfaction (Mehnert-Theuerkauf *et al*., 2023). Cultural sensitivity is another aspect to consider for improved health outcomes (Agerholm *et al*., 2023). Hence, the hypothesis has formed:

H_7: A significantly positive relationship exists between respect for patient preferences and perceived service quality.

Physical Comfort and Perceived Service Quality

In a healthcare setup, physical comfort typically includes cleanliness, environment, and infrastructure quality affecting patient experience (Tian, 2023). Comfortable healthcare settings reduce stress and increase perceptions (Kalaja, 2023). Evidence reflects that a strong positive relationship exists between physical comfort and perceived service quality (Emon *et al*., 2023). Whereas bad environments reduce satisfaction (Haryaningsih *et al*., 2023). Hence, forming the hypothesis:

H_8: There is a significantly positive relationship between physical comfort and perceived service quality.

Continuity and Transition and Overall Patient Satisfaction

Continuity and transition make the smooth care delivery happen and enhance satisfaction (Omaghomi et al., 2024). Smooth transitions promote trust (Sun *et al.,* 2023), while ineffective coordination reduces satisfaction (Friedel *et al*., 2023). Hence, the hypothesis has formed:

H_9: A significantly positive relationship exists between continuity and transition and overall patient satisfaction.

Coordination of Care and Overall Patient Satisfaction

As discussed under the above dimension, care coordination significantly enhances satisfaction by integrating services and minimizing errors (Alibrandi *et al*., 2023). Poor coordination leads to dissatisfaction (Khatri *et al.,* 2023). The quality of coordination in social media platforms (Baig *et al*., 2025) and the frontline staff behavior (Baseerat *et al*., 2023). Hence, the hypothesis has formed:

H_{10}: There is a significantly positive relationship between care coordination and overall patient satisfaction.

Emotional Support and Overall Patient Satisfaction

Same as the case of friends and family, the emotional support by the caregivers reduces anxiety and increases satisfaction (Tian, 2023). Empathy dimension promotes patient trust (Mehnert-Theuerkauf *et al*., 2023). The emotional aspect is covered in the HealthQual, and other patient-centered dimensions (e.g., Amin & Baig, 2025; Maqbool *et al*., 2025; Sehrish *et al*., 2024; Siddiqui & Baig, 2024) help enhance patient satisfaction. Hence, the hypothesis has formed:

H_{11}: There is a significantly positive relationship between emotional support and overall patient satisfaction.

Involvement of Family and Friends and Overall Patient Satisfaction

Family involvement also promotes emotional stability, leading to satisfaction (Khatri *et al*., 2023). The involvement of the family has a profound impact on compliance with the treatment plan (Siddiqui & Baig, 2024). It increases compliance with the care plan and thus the healthcare outcomes (Omaghomi *et al*., 2024). Hence, the hypothesis has formed:

H_{12}: There is a significantly positive relationship between the involvement of family and friends and overall patient satisfaction.

Information, Education, and Overall Patient Satisfaction

When the patient is well-informed and educated about their treatment plan, it enhances the overall patient satisfaction. It is important that patients know their illnesses, treatment options, and expected outcomes, so that they make a more informed health decision.

Educational and informational interventions minimize uncertainty and fear of mistrust in a healthcare encounter (Alibrandi *et al*., 2023). It enhances adherence to treatment plans, improving health outcomes and reducing morbidity (Emon *et al*., 202; Khatri *et al*., 2023; Tian, 2023). Moreover, education promotes respect and trust in healthcare delivery systems (Tian, 2023), and structured information-sharing increases satisfaction and fosters the patient–physician relationship (Chen *et al*., 2023):

H_{13}: There is a significantly positive relationship between information and education and overall patient satisfaction.

Respect for Patient Preferences and Overall Patient Satisfaction

Central to patient-centered care is the respect given to patients' preferences as the caregivers acknowledge patients' values, beliefs, and choices. Patients feel respected and actively engaged, which strengthens trust and the patient–provider relationship (Omaghomi *et al.,* 2024). It encourages active participation in decisions that, in turn, enhance adherence to treatment plans, thus improving health outcomes, with cultural sensitivity (*Chen et al*., 2023; Friedel *et al*., 2023). The individualized care and shared decision-making promote satisfaction and trust (Kalaja, 2023):

H_{14}: A significantly positive relationship exists between respect for patient preferences and overall patient satisfaction.

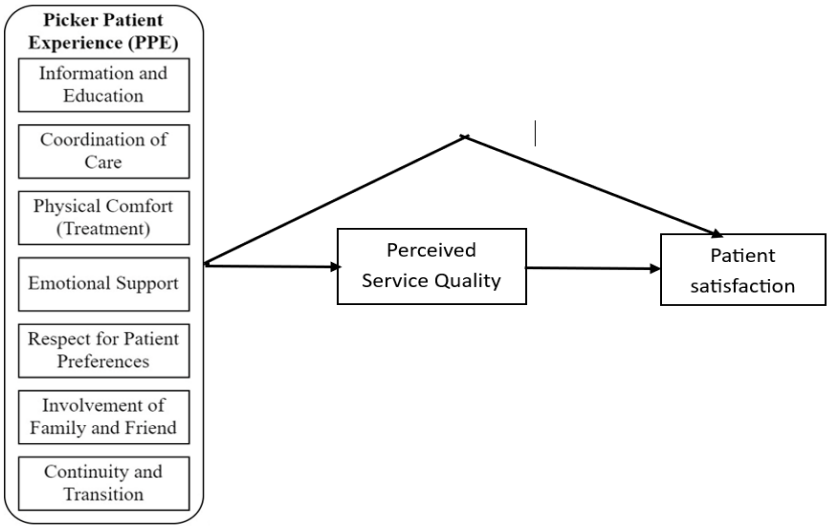
Physical Comfort and Overall Patient Satisfaction

Physical comfort is another important determinant of overall patient satisfaction in healthcare (Tian, 2023). Patient well-being rests heavily on the physical environment that reduces the risk of hospital-acquired infections (Kalaja, 2023). It is central to patient care to address discomfort, pressure ulcer prevention, appropriate repositioning, and comfortable bedding to demonstrate quality care and build patient trust (Friedel *et al*., 2023). Physical comfort minimizes stress, increases recovery likelihood, and promotes satisfaction (Tian, 2023; Akthar *et al*., 2023), which leads to the development of the hypothesis:

H_{15}: There is a significantly positive relationship between physical comfort and overall patient satisfaction.

Figure 1

Research Framework (Source: Author's own work)



METHODS AND MATERIALS

This study employs a structured methodological framework to examine the relationship between perceived service quality and patient satisfaction in tertiary care hospitals. The design supports hypothesis testing grounding to established theories and statistically driven analysis of associations (Habu & Henderson, 2023; Hamzani *et al*., 2023). The study used a quantitative approach, achieved through structured questionnaires to ensure objectivity and generalizability (Cheong *et al*., 2023; Yazdani *et al*., 2023). Moreover, a deductive approach is followed based on existing theories to develop and test hypotheses (Denscombe, 2024). A cross-sectional, cause-and-effect analysis was made as per the existing studies for a timely healthcare insight (Habu & Henderson, 2023; Samanth, 2024; Rice, 2023).

Population and Sampling

The study population consists of patients receiving healthcare services from tertiary care hospitals, including both inpatient and outpatient departments. With the individual patient as the unit of analysis for this study. Each patient's perceptions of service quality and satisfaction are treated as distinct data collected through a structured questionnaire. The sample size is determined using Green's (1991) formula, n = 50 + 8k, where k represents the number of predictor variables.

In this study, k = 10, resulting in a minimum required sample size of 130 respondents. However, to improve reliability and strengthen statistical analysis, a total of 272 valid responses were collected for the study. A non-probability convenience sampling technique is used to approach respondents. This sampling is particularly suitable in hospital settings due to time and resource constraints, allowing efficient access to many patients in a short period. Although this approach may limit

generalizability, it provides practical and timely insights into patient perceptions of service quality and satisfaction (Wrzus & Neubauer, 2023; Rajput *et al*., 2023).

Study Measures

A structured questionnaire based on a 5-point Likert scale is used with options from strongly disagree to strongly agree as used in various similar research (e.g., Willson & Miller, 2014; Morgan & Harmon, 2001). The independent variables were measured using the Picker Patient Experience (PPE) framework, as all items were adapted from Picker Institute instruments developed by Jenkinson, Coulter, and Bruster (2002).

Perceived service quality, the mediating variable, was measured using eight items adapted from Gupta *et al*. (2012). Patient satisfaction, the dependent variable, was assessed using eight items also adapted from Jenkinson, Coulter, and Bruster (2002). The use of validated scales ensures reliability and consistency in measurement, enabling robust statistical analysis of the relationships among perceived service quality and patient satisfaction. The details of the adapted items are mentioned in Table 1.

Table 1
Measures of Study

Constructs	References	Items
Information and Education	Jenkinson, Coulter, and Bruster (2002)	4
Coordination of Care	Jenkinson, Coulter, and Bruster (2002)	5
Physical Comfort (Treatment)	Jenkinson, Coulter, and Bruster (2002)	5
Emotional Support	Jenkinson, Coulter, and Bruster (2002)	4
Respect for Patient Preferences	Jenkinson, Coulter, and Bruster (2002)	3
Involvement of Family and Friends	Jenkinson, Coulter, and Bruster (2002)	3
Continuity and Transition	Jenkinson, Coulter, and Bruster (2002)	4
Perceived Service Quality	Gupta *et al*. (2012)	5
Patient Satisfaction	Jenkinson, Coulter, and Bruster (2002)	5

Data Collection and Analysis

A self-administered and online survey was administered to ensure accessibility and convenience for patients (e.g., Hernandez-Pavon *et al*., 2023), ensuring anonymity of respondents (Whang *et al*., 2023; Keusch *et al*., 2023).

Structural Equation Modelling Technique (PLS-SEM) was used with Smart PLS 4 software, which is a robust technique for examining complex relationships between variables (Shiau *et al*., 2019; Hair *et al*., 2021). Descriptive analysis of the demographic profile of respondents was made with SPSS 26.

Ethical Considerations

The respondents' anonymity and confidentiality were ensured. This study ensures informed consent, voluntary participation, and the right to withdraw without consequences (Rani & Sharma, 2012; Connelly, 2014). It was ensured that no harm to respondents was caused, making sure their respectful and sensitive questioning (Gajjar, 2013).

RESULTS AND FINDINGS

Respondents' Profile

Table 2

Demographic Profile of the Respondents (n=272).

Demographics	Scale	Frequency	Percent
Age Group (Years)	25-35	52	19.1
	36-45	49	18
	46-55	57	21
	56-65	64	23.5
	Above 65	50	18.4
Gender	Male'	142	52.2
	Female	130	47.8
Education Level	Primary	54	19.9
	Secondary	55	20.2
	Higher Secondary	58	21.3
	Undergraduate	54	19.9
	Postgraduate	51	18.8
Marital Status	Single	67	24.6
	Married	67	24.6
	Divorced	67	24.6
	Widowed	71	26.1
Monthly Income	Less than 20,000 PKR	57	21
	20,000 – 50,000 PKR	56	20.6
	50,001 – 100,000 PKR	56	20.6
	100,001 – 200,000 PKR	56	20.6
	Above 200,000 PKR	47	17.3
Employment Status	Employed	61	22.4
	Self-employed	44	16.2
	Unemployed	53	19.5
	Student	48	17.6
	Retired	66	24.3
Type of Hospital	Private	123	45.2
	Public	149	54.8

The demographic profile of the study participants includes a total of 272 individuals. In terms of age, 19.1% are aged 25–35 years, 18% are 36–45 years, 21% are 46–55 years, 23.5% are 56–65 years, and 18.4% are above 65 years. Gender distribution shows 52.2% males and 47.8% females. Regarding education, 19.9% have primary education, 20.2% secondary, 21.3% higher secondary, 19.9% undergraduate, and 18.8% postgraduate qualifications.

Marital status indicates equal representation of single, married, and divorced participants (24.6% each), while widowed individuals represent 26.1%. Income levels show a relatively even distribution across categories, with the highest proportion earning less than 20,000 PKR (21%) and the lowest, above 200,000 PKR (17.3%). Employment status includes employment (22.4%), retirement (24.3%), unemployed (19.5%), students (17.6%), and self-employed (16.2%). Finally, 54.8% of participants used public hospitals, while 45.2% preferred private hospitals

Measurement Model

Construct Validity

PLS algorithm was run to assess the quality criteria of the measures and their items. Table 4 presents the results of the measurement model, reflecting that the indicators have higher loadings than the recommended threshold of 0.70 (Hair *et al*., 2022; Hair *et al*., 2011b).

Moreover, the measures of reliability, including Cronbach's alpha and composite reliability, have higher values than the recommended threshold of 0.7, such that reliability is established (Hair *et al*., 2019). Also, the higher AVE coefficient than the desired threshold of 0.5 (Hair *et al*., 2011b, 2013) has been achieved, showing that the convergent validity is established.

Discriminant Validity

Discriminant validity assessment was made using the Fornell-Larcker Criteria. As shown in Table 3, the bold values in the diagonal represent the square root of the AVE coefficients) exceeding their respective correlation coefficients, showing that constructs have a higher degree of variance than their correlation with other constructs (Hamid *et al*., 2017; Fornell & Larcker, 1981). The constructs differ substantially from other constructs; thus, discriminant validity is achieved using FLC.

Table 3

Fornell-Larcker Criterion (FLC)

	CC	CT	ES	IE	IFF	PC	PSAT	RPP	SQ
CC	0.848								
CT	-0.002	0.831							
ES	0.523	0.021	0.806						
IE	0.286	0.061	0.319	0.868					
IFF	0.294	0.053	0.307	0.465	0.849				
PC	0.019	0.055	0.287	0.513	0.486	0.886			
PSAT	0.138	0.040	0.433	0.570	0.453	0.726	0.857		
RPP	-0.041	-0.411	-0.053	-0.049	-0.040	-0.051	0.059	0.898	
SQ	0.244	0.015	0.399	0.570	0.449	0.675	0.746	0.059	0.811

Coordination of Care; CT = Continuity and Transition; ES = Emotional Support; IE = Information and Education; IFF = Involvement of Family and Friend; PC = Physical Comfort (Treatment); PSAT = Overall Patient Satisfaction; RPP = Respect for Patient Preferences; SQ = Perceived Service Quality

Table 4

Items of Measures, Reliability, and Convergent Validity

Items	Loadings	α	CR	AVE
CC1: My emergency care was well organized.	0.854	0.911	0.928	0.720
CC2: My admission process was well organized.	0.857			
CC3: I did not have to wait too long to go to the ward.	0.875			
CC4: I was informed about which doctor was in overall charge of my care.	0.843			
CC5: The staff provided consistent information.	0.813			
CT1: The purpose of my medicines was fully explained to me	0.823	0.891	0.898	0.691
CT2: I was told about the medication side effects	0.912			
CT3: I was told about danger signals to watch at home	0.653			
CT4: I was told when to resume normal activities	0.910			
ES1: The doctor discussed my anxieties or fears.	0.820	0.836	0.881	0.650
ES2: I always had confidence and trust in the doctors.	0.819			
ES3: I always had confidence and trust in the nurses.	0.764			
ES4: It was easy to find someone to talk to about my concerns.	0.820			
IE1: I was given enough information in the accident and emergency unit.	0.861	0.891	0.924	0.754
IE2: The delay in admission to the ward was clearly explained.	0.846			
IE3: The doctors' answers to my questions were clear.	0.916			
IE4: The nurses' answers to my questions were clear.	0.848			
IF1: My family had the opportunity to talk to the doctor.	0.883	0.804	0.885	0.720
IF2: My family was given enough information about my condition.	0.880			
IF3: My family was given the information needed to help me recover.	0.779			
PC1: I received help to go to the bathroom/toilet when needed.	0.815	0.932	0.948	0.786
PC2: I did not have to wait too long after pressing the call button.	0.903			
PC3: I did not have to wait too long for pain medicine.	0.886			
PC4: The staff did enough to control my pain.	0.910			
PC5: I was given the right amount of pain medicine.	0.914			
RP1: The doctors always talked to me as if I were present and involved.	0.876	0.885	0.925	0.806
RP2: The nurses always talked to me as if I were present and involved.	0.874			
RP3: I was sufficiently involved in decisions about my treatment and care.	0.941			
SAT1: The courtesy of the admissions staff was good.	0.864	0.910	0.933	0.735
SAT2: The courtesy of the doctors was good.	0.818			
SAT3: The availability of the doctors was good.	0.879			
SAT4: The courtesy of the nurses was good.	0.867			
SAT5: The availability of the nurses was good.	0.857			
SQ1: I am satisfied with the ease of the registration process.	0.718	0.870	0.905	0.657
SQ2: I am satisfied with the speed of the registration process.	0.838			
SQ3: I am satisfied with the timeliness with which my care was delivered.	0.848			
SQ4: I am satisfied with the ease with which my care was delivered.	0.798			
SQ5: I am satisfied with the team helping me understand my medica condition.	0.845			

HTMT Ratio

Henseler *et al*. (2016); Henseler *et al*. (2015) argued that the HTMT ratio between two latent constructs should be less than 0.90 to establish discriminant validity. Table 5 shows that all the values are well below the threshold values, with only one ratio (i.e., between SQ and PSAT obtained the highest value of 0818, still lower than the threshold. It implies that discriminant validity using the HTMT ratio has been attained.

Table 5

HTMT Ratio

	CC	CT	ES	IE	IFF	PC	PSAT	RPP	SQ
CC									
CT	0.042								
ES	0.663	0.064							
IE	0.291	0.047	0.327						
IFF	0.325	0.045	0.323	0.548					
PC	0.127	0.061	0.245	0.563	0.57				
PSAT	0.142	0.051	0.447	0.629	0.528	0.773			
RPP	0.053	0.545	0.059	0.056	0.058	0.057	0.069		
SQ	0.274	0.051	0.411	0.644	0.537	0.732	0.818	0.061	

Structural Model

Hypothesis Testing using PLS Path Analysis

Table 6 shows the result of PLS path modeling analysis using the PLS bootstrapping technique for hypothesis testing.

Table 6

Hypothesis Testing using PLS Path Analysis

Path Relationships	Beta	Std. Dev.	t-Stats	Prob.	Decision
CC -> PSAT	-0.104	0.037	2.797	0.005	Supported
CC -> SQ	0.099	0.046	2.146	0.032	Supported
CT -> PSAT	0.070	0.052	1.344	0.179	Not Supported
CT -> SQ	0.007	0.061	0.120	0.904	Not Supported
ES -> PSAT	0.192	0.061	3.178	0.001	Supported
ES -> SQ	0.124	0.057	2.159	0.031	Supported
IE -> PSAT	0.138	0.050	2.772	0.006	Supported
IE -> SQ	0.233	0.052	4.504	0.000	Supported
IFF -> PSAT	0.026	0.036	0.733	0.464	Not Supported
IFF -> SQ	0.032	0.052	0.612	0.541	Not Supported
PC -> PSAT	0.338	0.055	6.104	0.000	Supported
PC -> SQ	0.509	0.044	11.676	0.000	Supported
RPP -> PSAT	0.035	0.049	0.717	0.473	Not Supported
RPP -> SQ	0.126	0.066	1.923	0.054	Not Supported
SQ -> PSAT	0.366	0.055	6.696	0.000	Supported

Table 6 gives a bird's-eye view of the results for Hypothesis Testing using PLS Path Analysis, which shows that Coordination of Care (CC) negatively influenced Overall Patient Satisfaction (PSAT; Beta = -0.104; p = 0.005) and positively influenced Perceived Service Quality (SQ; Beta = 0.099; p = 0.032). Continuity and Transition (CT) did not have a significant effect on Overall Patient Satisfaction (PSAT; Beta = 0.070; p = 0.179) or Perceived Service Quality (SQ; Beta = 0.007; p = 0.904). Emotional Support (ES) positively influenced both Overall Patient Satisfaction (PSAT; Beta = 0.192; p = 0.001) and Perceived Service Quality (SQ; Beta = 0.124; p = 0.031). Information and Education (IE) positively influenced Overall Patient Satisfaction (PSAT; Beta = 0.138; p = 0.006) and Perceived Service Quality (SQ; Beta = 0.233; p = 0.000). Involvement of Family and Friends (IFF) did not significantly influence Overall Patient Satisfaction (PSAT; Beta = 0.026; p = 0.464) or Perceived Service Quality (SQ; Beta = 0.032; p = 0.541). Physical Comfort (PC) positively influenced both Overall Patient Satisfaction (PSAT; Beta = 0.338; p = 0.000) and Perceived Service Quality (SQ; Beta = 0.509; p = 0.000). Respect for Patient Preferences (RPP) did not significantly influence Overall Patient Satisfaction (PSAT; Beta = 0.035; p = 0.473) or Perceived Service Quality (SQ; Beta = 0.126; p = 0.054). Perceived Service Quality (SQ) positively influenced Overall Patient Satisfaction (PSAT; Beta = 0.366; p = 0.000).

Predictive Relevance of the Endogenous Constructs

Table 7 shows the result of predictive power and relevance of the endogenous latent constructs in the structural model using the PLS algorithm and PLS blindfolding techniques.

Table 7

Predictive Relevance

Predictors	R-Square	Q-Square
Overall Patient Satisfaction	0.695	0.594
Perceived Service Quality	0.570	0.485

Hair *et al*. (2011a) suggested that an R2 higher than 50% of an endogenous latent construct in the structural model is considered to have a substantial predictive power, while Hair *et al*. (2013) recommended that an endogenous latent construct with Q2 higher than 0.30 is considered substantially strong relevance in the structural model.

Mediation Analysis

Table 8

Path analysis with Perceived Service Quality as Mediator

Constructs	Beta Coefficients	S.D.	t statistics	p Value
IE -> SQ -> PSAT	0.085	0.022	3.911	0.000
IFF -> SQ -> PSAT	0.012	0.019	0.601	0.548
PC -> SQ -> PSAT	0.186	0.034	5.421	0.000
RPP -> SQ -> PSAT	0.046	0.025	1.858	0.063
CC -> SQ -> PSAT	0.036	0.017	2.134	0.033
CT -> SQ -> PSAT	0.003	0.023	0.119	0.905
ES -> SQ -> PSAT	0.045	0.023	1.940	0.052

The mediation analysis results indicate that Perceived Service Quality (SQ) significantly mediates the relationship between certain patient experience factors and Overall Patient Satisfaction (PSAT). Specifically, Information and Education (IE) ($\beta = 0.085$, $p < 0.001$) and Physical Comfort (PC) ($\beta = 0.186$, $p < 0.001$) exhibit statistically significant mediation effects, suggesting that these factors contribute to enhanced service quality, which in turn positively impacts patient satisfaction. Coordination of Care (CC) ($\beta = 0.036$, $p = 0.033$) also shows a significant mediation effect, albeit at a lower magnitude. Respect for Patient Preferences (RPP) ($\beta = 0.046$, $p = 0.063$) and Emotional Support (ES) ($\beta = 0.045$, $p = 0.052$) are marginally significant, indicating a potential mediating

role that warrants further exploration. However, the mediation effects of Involvement of Family and Friends (IFF) (β = 0.012, p = 0.548) and Continuity and Transition (CT) (β = 0.003, p = 0.905) are not statistically significant, suggesting that these factors may not substantially influence patient satisfaction through perceived service quality.

DISCUSSION AND CONCLUSION

The findings of this study provide a detailed view of how different dimensions of perceived service quality influence patient satisfaction in tertiary care hospitals. Overall, the results reveal that perceived service quality has a significantly positive effect on patient satisfaction, which is consistent with previous evidence. Similar findings were reported by Wu *et al*. (2024), who emphasized that patient satisfaction increases when healthcare services are reliable, responsive, and supported by effective communication and clean environments. Likewise, Omaghomi *et al*. (2024) found that satisfaction depends on the question of whether healthcare services meet or exceed patient expectations, reinforcing the importance of professionalism, empathy, and efficiency in care delivery. Among the service quality dimensions, coordination of care showed a significant positive relationship with perceived service quality, aligning with Bentum-Micah *et al*. (2024) and Ojo *et al*. (2024), who highlighted that collaboration among healthcare professionals improves treatment consistency, trust, and patient confidence. Similarly, emotional support was found to significantly enhance both perceived service quality and satisfaction, supporting Lyu *et al*. (2024) and Fuady *et al*. (2024), who emphasized the role of empathy and reassurance in reducing patient anxiety and improving healthcare experiences. Information and education also demonstrated a strong positive impact on both constructs. This finding is consistent with Omaghomi *et al*. (2024) and Hartono *et al*. (2024), who noted that clear and comprehensive communication improves patient understanding, trust, and treatment adherence. Physical comfort similarly showed a positive effect, supported by Bentum-Micah *et al*. (2024) and Syahputri *et al*. (2024), who found that a comfortable environment enhances perceived care quality and overall satisfaction. In contrast, continuity and transition showed a positive but insignificant effect on both perceived service quality and satisfaction, consistent with Ojo *et al*. (2024) and Çakmak and Ugurluoglu (2024), who argued that patients often do not directly observe care transitions. Likewise, involvement of family and friends and respect for patient preferences were found to be insignificant predictors in both relationships. These findings align with Bentum-Micah *et al*. (2024), Hussien (2024), and Earp *et al*. (2024), suggesting that patients primarily focus on direct clinical interactions rather than indirect or culturally variable factors. Interestingly, coordination of care showed a negative but significant effect on patient satisfaction, supporting Omaghomi *et al.* (2024) and Strohschein *et al.* (2024), who reported that poor coordination, delays, and fragmented communication can reduce satisfaction levels. Overall, the results confirm that emotional, informational, and coordination-related aspects of care are the most influential drivers of perceived service quality and patient satisfaction in healthcare settings

The study confirms a positive relationship between perceived service quality and patient satisfaction in tertiary care hospitals in Karachi, Pakistan. Using the Picker Patient Experience Model, key service quality dimensions influencing satisfaction were identified. The quantitative analysis supports the importance of service quality in shaping patient outcomes and provides meaningful insights for healthcare improvement strategies.

LIMITATIONS

This study is limited by its exclusive reliance on the Picker Patient Experience Model, which, although comprehensive in measuring patient-centered care, does not capture broader systemic factors such as technological integration, resource allocation, or administrative efficiency that may also influence patient satisfaction. It also primarily focuses on patient perceptions, potentially overlooking healthcare staff dynamics and interdisciplinary coordination in service delivery. The absence of cultural and linguistic considerations further restricts the understanding of diverse patient expectations. Additionally, the study does not compare tertiary care hospitals with primary or rural healthcare systems, limiting broader contextual interpretation. External influences such as socioeconomic conditions and healthcare policy frameworks were also not examined. Methodologically, convenience sampling and a cross-sectional design limit generalizability and the ability to observe changes over time, while self-reported data may introduce social desirability bias and restrict applicability to other healthcare settings

RECOMMENDATIONS

Healthcare providers should enhance communication regarding diagnosis, treatment, and side effects. Strong interdepartmental coordination is essential to ensure seamless patient care. Improvements in hospital environment, including cleanliness, noise control, and comfort, should be prioritized. Emotional support and patient involvement in decision-making should be strengthened to build trust and satisfaction. Family involvement in care planning should be encouraged where appropriate. Regular patient feedback systems, including post-discharge surveys, should be implemented to support continuous service improvement.

FUTURE RESEARCH DIRECTION

The current research may be enhanced by a qualitative design to have a deeper understanding of the patient-centered approaches. Moreover, a public-private comparison may give additional understanding of the subject matter for a developing country context. Finally, department-specific studies, such as Inpatient vs. Outpatient, gynecology and obstetrics, medicine, or surgery patients, may be investigated to understand the function-specific issues pertinent to PPE.

THEORETICAL SIGNIFICANCE

This study contributes to the literature by extending the Picker Patient Experience Model and highlighting perceived service quality as a mediator of patient satisfaction. It isolates patient experience from organizational factors such as employee satisfaction, offering a more focused understanding of patient-centered care. The study also extends the applicability of the model to a developing country context, enriching theoretical perspectives in healthcare research.

PRACTICAL SIGNIFICANCE

Practically, the findings provide evidence-based guidance for healthcare policymakers and providers to improve service delivery through patient-centered care. By focusing on key service quality dimensions, hospitals can enhance patient satisfaction, strengthen trust, and improve healthcare outcomes. These insights are particularly relevant for developing healthcare systems like Pakistan, where improving service quality is essential for sustainability and competitiveness.

DECLARATION

Ethical Consideration: This study strictly adhered to the Declaration of Helsinki and relevant national and institutional ethical guidelines. Informed consent was obtained. All procedures performed in this study were consistent with the ethical standards of the Declaration of Helsinki.

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Similarity Index/ Plagiarism: The similarity index was checked, and it is 16% that is well below the threshold value of 19%, whereas each source is less > 5%.

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