Analyzing the Influence of Patient Safety Culture on Patient Satisfaction Using the Kano Model in a Multispecialty Hospital.

[1]Saranya.M, [2]K.N. Priya,

[1]*Student, Faculty of Management Sciences, Sri Ramachandra Institute of Higher Education and Research, Chennai*
[2]*Assistant Professor, Faculty of Management Sciences, Sri Ramachandra Institute of Higher Education and Research, Chennai*

ARTICLE INFO	ABSTRACT
	Patient safety culture plays a crucial role in shaping patient care, outcomes, and satisfaction. This study examines its influence on patient satisfaction using the Kano model, incorporating the Service Quality (SERVQUAL) dimensions. The Agency for Healthcare Research and Quality questionnaire assessed patient safety culture among nurses, while patient satisfaction was measured through surveys of attendees in the pediatric department. However, regression analysis revealed a minimal impact of patient safety culture on patient satisfaction, with low R-square values (0.000 to 0.027). These findings suggest that patient safety culture alone may not be a significant determinant of patient satisfaction. Further research is needed to explore additional factors that contribute to patient experiences in healthcare settings. **Keywords:** Patient safety culture; Patient care; Patient satisfaction; Kano model; service quality dimensions; Patient attendees; Nurses; Pediatric department; Healthcare settings; Influential attributes.

1   INTRODUCTION

Patient satisfaction and safety culture are vital aspects of healthcare delivery, impacting patient care and outcomes. This study uses the Kano model to analyze patient satisfaction and identify key factors influencing healthcare consumer choice, and safety culture impact on patient satisfaction in the pediatric department addressing the scarcity of research in this area. The research will focus on understanding patient expectations, measuring service quality, and building a patient safety culture in healthcare organizations. By utilizing the SERVQUAL instrument in the pediatric population, the study aims to assess patient satisfaction and safety culture's impact on their experiences. Emphasizing patient-centeredness and value-based care, the research will consider nurses' perspectives on safety culture and patient satisfaction. Ultimately, this study seeks to contribute valuable insights to improve patient experiences and prioritize patient safety and satisfaction in healthcare settings.

The pediatric population set out to be one of the vulnerable patient groups with the complexity of providing safer and quality services in terms of hospitalization and preventive care in outpatient care settings. Patient Satisfaction in the Paediatric Department through the SERVQUAL instrument measures five dimensions-Tangibility, Reliability, Responsiveness, Assurance, and Empathy is standardized using the Kano model scale identifying the attributes under each of these five dimensions were first published in 1985 by a team of academic researchers, A. Parasuraman, Valarie Zeithaml, and Leonard L. Berry to measure using SERVQUAL and Kano Model by Noriaki Kano, 1984 respectively, stated still used by several studies of service quality [34].

Patient satisfaction hovering around the basic amenities of getting treated for the price they pay is beyond the value of the price paid by the consumer(patients) rather than boasting on the consumer's satisfaction on the superficial aspects, nowadays be it the healthcare industry or any other service industry paces itself towards the consumers' experience tied to the quality and safety pitching of the healthcare field.

Value-Based Care and Patient-Centeredness: The Importance of Safety Culture in Healthcare: The journey towards patient-centeredness in healthcare is long and challenging. However, the endurance of value-based care has paved the way for exploring experiences that put patients at the centre of care. A crucial aspect of this journey is consumer engagement, which involves co-creation with stakeholders in the healthcare system.

For nearly 20 years, the AHRQ (Agency for Healthcare Research and Quality) has been developing a patient safety culture program. This program focuses on advancing the SOPS program through a scientific understanding of safety culture in healthcare settings. The program uses Surveys on Patient Safety Culture to identify the beliefs, values, and norms shared by staff that impact their actions and behaviours concerning patient safety. The program aims to improve the SOPS program by analyzing the safety culture in healthcare settings. The program is centred on the healthcare staff collective beliefs, values, and norms, directly impacting their actions and behaviours regarding patient safety. Promoting patient satisfaction and experience ultimately leads to better patient outcomes. Promoting a safety culture in healthcare settings is crucial to ensure the longevity of value-based care and prioritize patient-centeredness. By elevating the patient experience and boosting satisfaction, healthcare providers can demonstrate their intense dedication to this culture [24], [37].

It is essential to support the "Agency for Healthcare Research and Quality (AHRQ)" to promote a culture of patient safety in healthcare settings [37]. They are critical to this effort. According to the Agency for Healthcare Research and Quality (AHRQ), an organization's safety culture is composed of the values, perceptions, competencies, and attitudes of individuals and groups, which shape the behaviour and commitment to health and safety within the organization [24]. Organizations embodying a positive safety culture foster communication rooted in mutual trust shared understanding of safety's significance, and a belief in the effectiveness of preventive measures." Nurses who work directly with patients in hospitals are evaluated on several dimensions, including teamwork, staffing levels, organizational learning, response to errors, support from supervisors and managers, communication about errors, reporting of safety events, hospital management support, handoffs, and information exchange [24].

The patient safety rating of their unit is also taken into account based on the number of reported events. The quantification of patient satisfaction in the Paediatric department among the patient attendees of the pediatric population, analyzing their perception and expectations, and bridging the gap with the providers' stance on the categorization under the Kano model as Must-be attributes, One-dimensional/Performance attributes, Attractive attributes, Indifferent attributes, Questionable and Reverse attributes regard the patient safety culture from the provider side analysis from the nurses' perspective on the expanse of the awareness of the patient safety, introspect on the trends and cultural impact of patient safety leadership and drive within units and across units upon the current status and comparison of patient safety culture among the nurses.

2   MATERIALS AND METHODS

2.1   Participants

A prospective, descriptive-analytical study was carried out to evaluate the quality of healthcare services in the pediatric department of a multi-speciality hospital. The study intrigued the provider's aspect as nurses spent more time with the patients, surveyed using standardized questionnaires from AHRQ (Agency for Healthcare Research and Quality) to assess patient safety culture. The assessment utilized a well-structured questionnaire based on the Kano model methodology. A total of 108 patient attendees in the pediatric department and a sample of 73 nurses (from a population of 140 nurses in the hospital) were selected through simple random sampling and participated in face-to- face interviews to complete the questionnaires. During the research, informed consent was obtained, from the patient attendees, and the questionnaire was administered, in both Tamil and English languages. The study also received approval from the institutional ethical committee, and data collection took place from April to May 2023, covering a period of two months.

2.2   Instrument

The research design adopted for this study was a descriptive and analytical approach to quantitative data. A well-structured questionnaire, incorporating the Kano model methodology, to evaluate the quality of healthcare services in the pediatric department of a multi-speciality hospital. The questionnaire consisted of 41 items categorized into five dimensions of service quality: Tangibility (12 items), Reliability (6 items), Responsiveness (9 items), Assurance

(8 items), and Empathy (6 items). Each dimension contained both functional and dysfunctional questions to gauge patient preferences. In total, there were 82 attribute questions, along with an additional 12 background questions, resulting in a total of 94 questions administered to patient attendees in the pediatric department.

For assessing patient safety culture, a separate open-source questionnaire provided by AHRQ (Agency for Healthcare Research and Quality) was distributed to nurses. The questionnaire consisted of 12 dimensions and a total of 45 questions, covering various aspects such as communication, hospital management support, staff support, teamwork, and incident reporting.

The sampling method employed for data collection was simple random sampling, ensuring that each member of the population had an equal likelihood of being selected.

The sample size for patient satisfaction was calculated using the formula

n = (Z-score) ^{2} * p(1-p) / (margin of error) ^{2},

assuming a 95% confidence level, a Z-score of 1.96, a population proportion (p) of 0.5, and a margin of error of ±9%. The resulting sample size was approximately 119 patient attendees in the pediatric department.

Similarly, for the assessment of patient safety culture among nurses, the sample size was determined based on a confidence level of 95%, a Z-score of 1.96, and a ±5% margin of error, considering a 50% response rate from the population. This resulted in a sample size of 70 nurses selected from a total population of 140 nurses in the hospital. It is important to note that the sample size may vary during the study period based on the response rate and other factors affecting data collection.

2.2 Methods and data analyses

The Kano model methodology allows for a comprehensive analysis of customer satisfaction by categorizing features based on their impact. In the study on patient satisfaction in the pediatric department, a structured questionnaire was designed using Kano model-based questions to assess various healthcare facility features. Participants provided their preferences on a scale ranging from "I like it" to "I dislike it."

•   **Must-be features:** Essential requirements that customers expect. Their absence leads to dissatisfaction, but their presence doesn't necessarily create higher satisfaction levels.

•   **Performance features:** The functionality of these features directly impacts customer satisfaction. Improved functionality leads to higher satisfaction, while reduced functionality results in decreased satisfaction.

•   **Attractive features:** Distinctive and surprising aspects of a product or service that evoke positive emotions and excitement in customers. These features go beyond customers' expectations and contribute to the overall appeal and desirability of the offering.

•   **Indifferent features:** Features that have little impact on customer satisfaction, regardless of their presence or absence.

•   **Reverse features:** Features that are not of interest to customers. Their absence leads to higher satisfaction.

For continuous analysis, participants' responses were assigned numerical values on a scale from -2 to +4. The average values were then used to categorize features. High positive values indicated a positive reaction to the feature's presence, while high negative values indicated a positive reaction to its absence.

Functional | Dysfunctional | Value: I dislike it | I like it | -2; I can tolerate it | I expect it | - 1; I am neutral | I am neutral | 0; I expect it | I can tolerate it | 2; I like it | I dislike it | 4

To identify feature categories, both discrete and continuous analyses were employed based on participants' responses. Additionally, statistical significance tests, including the Fong test and Blauth's formula, were used to ensure the robustness of the results. This comprehensive approach provided valuable insights into patient preferences and satisfaction levels regarding healthcare features, enabling effective prioritization of feature enhancements to improve overall patient satisfaction in the pediatric department.

The Modified Fong test calculated the Q-value by comparing occurrences of the most and second most frequent responses for each feature. If the absolute difference between these responses exceeded the Q-value, the feature's categorization was considered statistically significant.

The Modified Fong Test: $|a-b| < 1.96 * \sqrt{(((a + b) * (2n-a-b))/2n)}$

a - Total frequency of the category in the first place

b- Total frequency of the category in second place and n – Total number of respondents

Blauth's formula calculated the category count based on the frequencies of the most frequent, second most frequent, and neutral or sometimes responses. By comparing the O+A+M (One-dimensional, Attractive, and Must-be) category count with the I+R+Q (Indifferent, Reverse, and Questionable) category count, the final category for each feature was determined.

For data analysis, a well-structured Kano questionnaire collected customer preferences and satisfaction regarding various healthcare facility features. Pairs of questions assessed customer reactions to feature presence (functional question) and absence (dysfunctional question). Responses were on a five-point scale from "I like it" to "I dislike it." Discrete analysis counted functional and dysfunctional responses for each feature and assigned Kano categories based on the majority response. Concurrently, continuous analysis assigned numerical values to responses (-2 to +4) and calculated averages to categorize features.

To evaluate the impact of each feature on customer satisfaction, satisfaction and dissatisfaction coefficients were computed using the following formulas:

Satisfaction coefficient (CS+):

CS+= (excitement + performance)/ (excitement + performance + threshold + indifferent)

CS+ = (A+O) / (A+O+M+I)

Dissatisfaction coefficient (DS-):

DS= (-1) * (performance + threshold)/ (excitement + performance + threshold + indifferent)

DS = (-1) * (O+M) / (A+O+M+I)

Statistical significance tests, including the Fong test and Blauth's formula, validated feature categorization. The Fong test compared the frequency of the most frequently assigned category (mode) with the frequency of the second most frequent category. The absolute difference exceeding the Q-value indicated statistical significance.

Blauth's formula compared O+A+M with I+R+Q to determine the final category for each feature.

The collected data were analyzed using these methodologies, providing valuable insights into customer expectations, priorities, and satisfaction levels regarding healthcare features. The study's findings enable evidence-based decision-making in feature prioritization and product development to improve overall patient satisfaction in the pediatric department effectively.

To assess patient safety culture, a survey questionnaire was distributed to nurses within the healthcare facility. The questionnaire was designed to capture their perceptions and attitudes towards various aspects of patient safety, such as communication, teamwork, error reporting, and overall safety culture. The data collection involved administering the questionnaire to a sample of healthcare professionals - nurses, ensuring representation from different departments and levels within the healthcare facility. The number of respondents and the total number of completed surveys were recorded for data analysis.

Positive Response Rate (PRR): The positive response rate was calculated by summing up the percentage of respondents who answered with positive responses (e.g., "Agree" and "Strongly Agree") to each item or statement. The total number of positive responses was divided by the total number of respondents and then multiplied by 100 to obtain the percentage.

Positive Response Rate (PRR) = (Number of Positive Responses / Total Number of Respondents) * 100

Negative Response Rate (NRR): Similarly, the negative response rate was calculated by summing up the percentage of respondents who answered with negative responses (e.g., "Disagree" and "Strongly Disagree") to each item or statement. The total number of negative responses was divided by the total number of respondents and then multiplied by 100 to obtain the percentage.

Negative Response Rate (NRR) = (Number of Negative Responses / Total Number of Respondents) * 100

Neutral Response Rate: The neutral response rate was calculated by summing up the percentage of respondents who answered with a neutral response (e.g., "Neutral") to each item or statement.

Neutral Response Rate = (Number of Neutral Responses / Total Number of Respondents) * 100

Positive Response Rate (PRR), Negative Response Rate (NRR), and Neutral Response Rate were calculated to provide insights into the overall perception of patient safety culture among healthcare professionals and staff. Descriptive statistics, such as mean, standard deviation, median, and mode, were computed for each item or statement to understand the central tendency, variability, and range of responses for each aspect of patient safety culture.

The study aimed to investigate the impact of patient safety culture on patient satisfaction. Regression analysis was conducted separately for each dimension of patient satisfaction, namely tangibility, reliability, responsiveness, assurance, and empathy. The patient safety culture was considered the independent variable, and each dimension of patient satisfaction was treated as a dependent variable.

The regression coefficients indicated the strength and direction of the relationship between patient safety culture and patient satisfaction dimensions. Positive coefficients indicated a positive impact, while negative coefficients suggested a negative impact. Statistical tests, such as the F-test, were performed to assess the statistical significance of the regression coefficients. The findings from the regression analyses were interpreted to understand the impact of patient safety culture on different dimensions of patient satisfaction. These insights can help healthcare organizations identify areas that require improvement in patient safety practices to enhance patient satisfaction effectively.

Reliability of the questionnaire

The Cronbach's alpha for the SERVQUAL dimensions under the Kano Model scale questionnaire is 0.70 and above, indicating an acceptable range, which denotes a good amount of internal consistency of the questionnaire that is justifiable. The overall reliability of the questionnaire is closer to 1, i.e., 0.9, indicating a higher internal consistency. In contrast, a pilot study acknowledged its reliability with 30 responses from a sample size of 108 participants. Similarly, the patient safety culture questionnaire showed an acceptable amount of internal consistency of 0.75 (Cronbach's alpha value)

3   RESULTS AND ANALYSES

Discrete analysis in the Kano model involves categorizing attributes based on customer responses into three categories: Must-Be, One-Dimensional, and Attractive features. Must-Be features are essential to meeting basic customer expectations, and their absence can lead to dissatisfaction. One-Dimensional features are directly proportional to customer satisfaction; the more they are present, the more satisfied customers will be. Attractive features go beyond expectations and delight customers, leading to high satisfaction levels. Discrete analysis was done to prioritize attributes for improvement and strategic decision-making. Table 1 depicts the results of the discrete analysis.

The hospital boasts an array of attractive features that create a patient-centred environment. Child-friendly amenities, including play areas and spacious breastfeeding rooms, ensure a comfortable experience for young families. Accessibility is a priority, with appropriately allocated waiting spaces, clear departmental signage, and wheelchair facilitation. The staff courteous attitude, easy identification through name cards, and empathetic rapport building foster a welcoming atmosphere. The hospital excels in reliability, offering up-to-date equipment, prompt attention, and doctors' visits adhering to scheduled times. Effective communication, guidance, and second opinion recommendations enhance patient satisfaction. Swift response and timely problem resolution reflect a commitment to patient needs. The assurance of patient examination and management in the best interest of individuals promotes trust. Empathetic emotional support and understanding of patient requirements create a

supportive setting. Convenient hospital operating hours and efficient communication channels contribute to a seamless experience.

Overall, the hospital's focus on these attractive features exemplifies its dedication to delivering exceptional healthcare services. The hospital's one-dimensional features in the category of Tangibility contribute significantly to its overall quality of care. The presence of diverse medical specialities ensures that patients have access to a wide range of specialized services and expertise. Maintaining high standards of cleanliness and hygiene creates a safe and healthy environment for patients, fostering confidence in the hospital's commitment to safety. The provision of a child-safe facility further enhances the hospital's appeal, assuring parents and caregivers that their young ones will receive the utmost care and protection. Together, these one-dimensional features exemplify the hospital's dedication to delivering top-notch healthcare services and ensuring a positive and comfortable experience for all patients. The hospital's must-be features, which are fundamental for meeting customer expectations and ensuring high-quality care, span across the categories of Reliability, Responsiveness, Assurance, and Empathy. Reliability is demonstrated through doctors providing briefings on follow-up care, maintaining error- free patient records, offering price transparency on procedures, and ensuring improvement after treatment. Responsiveness is achieved by doctors explaining diagnosis results and treatment side effects in an understandable manner, informing patients about the length of hospitalization, and providing advance instructions for lab/radiological diagnosis. Assurance is established through the hospital staff creating trust and security, treating patients fairly and equally, explaining medication instructions accurately, providing clinically compatible services that ensure patient safety, and promptly addressing errors during procedural attempts. Finally, empathetic features include convenient visiting hours for visitors. These must-be attributes reflect the hospital's commitment to reliable, responsive, and compassionate care, meeting the essential needs of patients and creating a foundation for exceptional healthcare services.

TABLE 1. Discrete analysis of the attributes (Kano model)

ATTRIBUTE	S	A	I	M	O	R	Q	CATEGORY
TANGIBILITY								
TA1		47	8	17	33	2	1	**A**
TA2		38	5	21	43	0	1	**O**
TA3		20	6	26	56	0	0	**O**
TA4		46	23	19	20	0	0	**A**
TA5		38	17	28	25	0	0	**A**
TA6		29	8	33	38	0	0	**O**
TA7		62	11	11	24	0	0	**A**
TA8		53	6	16	33	0	0	**A**
TA9		44	8	23	33	0	0	**A**
TA10		40	7	29	32	0	0	**A**
TA11		43	14	19	32	0	0	**A**
TA12		46	25	24	13	0	0	**A**
RELIABILITY								
RL1		32	7	40	29	0	0	**M**
RL2		56	12	13	26	1	0	**A**
RL3		25	8	41	34	0	0	**M**
RL4		28	12	51	17	0	0	**M**
RL5		25	2	48	32	1	0	**M**
RL6		32	10	17		0	1	**A**
RESPONSIVENESS								
RE1		59	23	14	12	0	0	**A**
RE2		28	6	51	23	0	0	**M**

RE3	27	6	52	23	0	0	**M**
RE4	38	13	31	26	0	0	**A**
RE5	37	36	14	21	0	0	**A**
RE6	33	19	35	21	0	0	**M**
RE7	46	27	15	20	0	0	**A**
RE8	55	13	21	19	0	0	**A**
RE9	30	8	47	22	1	0	**M**
ASSURANCE							
AS1	27	14	48	19	0	0	**M**
AS2	43	27	25	13	0	0	**A**
AS3	17	11	62	18	0	0	**M**
AS4	32	9	48	18	1	0	**M**
AS5	22	6	58	22	0	0	**M**
AS6	20	11	56	21	0	0	**M**
AS7	38	26	20	23	1	0	**A**
AS8	45	35	12	16	0	0	**A**
EMPATHY							
EM1	46	14	35	13	0	0	**A**
EM2	38	15	30	25	0	0	**A**
EM3	36	16	42	12	0	0	**M**
EM4	41	10	36	20	1	0	**A**
EM5	43	17	27	19	2	0	**A**
EM6	38	14	36	18	2	0	**A**

TA-Tangibility, RL-Reliability, RE-Responsiveness, AS-Assurance, EM- Empathy, A-Attractive, O- One-dimensional, M-Must-be. (**Source:** Primary data)

Continuous analysis in the Kano model is conducted to understand the level of satisfaction and dissatisfaction customers experience with specific attributes. It involves measuring the customer satisfaction percentage (CS+), customer dissatisfaction percentage (DS-), and Total Satisfaction Index (TSI) for each attribute. In this study, continuous analysis was implemented in the Kano model to assess customer satisfaction levels across various attributes in the hospital. Unlike discrete analysis, which categorizes attributes into Must-Be, One-Dimensional, and Attractive features, continuous analysis provides a more nuanced understanding of how each attribute impacts customer satisfaction in Table 2.

Analyzing the results, it is evident that several attributes fall under the Attractive category, with high CS+ percentages and low DS- percentages. These features, such as the child play area, allocation of appropriate waiting space, and clear departmental signage, create delight for customers and contribute significantly to a patient-centred environment.

On the other hand, some attributes are categorized as One-Dimensional, with relatively high CS+ percentages but higher DS- percentages. These features, like doctors' visit times adherence and prompt attention, are directly linked to customer satisfaction, but their shortcomings can lead to dissatisfaction.

A significant number of attributes are identified as Must-Be, with high DS- percentages indicating that their absence can result in severe customer dissatisfaction. These attributes, such as doctors' briefings on follow-up care, error-free patient records, and informative medication explanations, are essential for meeting basic customer expectations.

Continuous analysis helps the hospital identify its strengths in delivering attractive and one-dimensional features while addressing areas of improvement for must-be attributes. By focusing on enhancing the satisfaction levels of must-be features and leveraging attractive features, the hospital can further enhance its patient experience and overall quality of care. The insights gained from continuous analysis play a crucial role in guiding strategic decisions to provide exceptional healthcare services that align with customer needs and preferences.

The CS+ (Customer Satisfaction) percentage indicates the level of satisfaction when the attribute is present, while

the DS- (Customer Dissatisfaction) percentage reflects dissatisfaction when the attribute is absent. The TSI (Total Satisfaction Index) represents the net satisfaction level for each attribute, combining positive and negative responses. The positioning of each attribute with its satisfaction and dissatisfaction levels, identifying the type of feature it represents from the scatter plot, while functional score (CS+) in the y-axis and dysfunctional score (DS-) in the x-axis. For plotting purposes, we consider the absolute value of the DS- (ignoring the negative sign) because we want to visualize the magnitude of dissatisfaction, not the direction.

The continuous analysis provides a detailed and nuanced understanding of customer preferences, enabling the hospital to identify strengths, weaknesses, and areas for improvement. Based on the results, the hospital can prioritize efforts to enhance attractive features, address must-be attributes effectively, and work on improving attributes with high dissatisfaction rates. Overall, continuous analysis in the Kano model allows the hospital to pinpoint strengths, areas for improvement, and critical attributes that contribute to customer satisfaction. By leveraging these insights, the hospital can strategically enhance its services and create a more patient-centric environment. By incorporating continuous analysis, the hospital can continually adapt and optimize its services to ensure exceptional patient experiences and higher overall satisfaction.

TABLE 2. Continuous analysis of the attributes (Kano model)

CODE	ATTRIBUTES	CS+	DS –	TSI	CATEGORIZATION OF ATTRIBUTES
	TANGIBILITY				
TA 1	Up–to–date and equipment availability	76%	– 48 %	29 %	A
TA 2	Specialities in the hospital	76%	– 60 %	16 %	O
TA 3	Cleanliness and hygiene	70%	– 76 %	– 60 %	O
TA 4	Child play area	61%	–36 %	25 %	A
TA 5	Adequate number of breastfeeding rooms, spacious and comfortable	58%	– 49 %	9 %	O
TA 6	Child–safe facility	62%	– 66 %	– 4 %	O
TA 7	Allocation of appropriate space for the waiting area	80%	–32 %	47 %	A
TA 8	Clear signage for the departments	80%	– 45 %	34 %	A
TA 9	Ramp facilitation for wheelchair	71%	– 52 %	19 %	O
TA 10	Wheelchairs and stretcher availability in appropriate numbers and places	67%	– 56 %	10 %	O
TA 11	Ambulatory services	69%	– 47 %	22 %	A
TA 12	Easy identification of staff (appropriate name cards and uniforms)	55%	– 34 %	20 %	I
	RELIABILITY				
RL 1	Doctors briefing on the follow-up care	56%	– 64 %	– 7 %	M
RL 2	Prompt attention in the allotted time	77%	– 36 %	40 %	A
RL 3	Maintenance of error-free records of the patient	55%	– 69 %	– 15 %	M
RL 4	Price transparency on the procedures/surgery advised	42%	– 63 %	– 21 %	M
RL 5	Improvement of the patient's condition after treatment	53%	– 75 %	– 22 %	M
RL 6	Doctors' visit times carried out exactly ± 15 minutes from the scheduled time	61%	– 25 %	36 %	A
	RESPONSIVENESS				
RE 1	Appropriate guidance after consultation by the staff	66%	– 24 %	42 %	A
RE 2	The doctor explains the results of the diagnosis in an understandable manner	47%	– 69 %	– 21 %	M
RE 3	The doctor explains the side effects of the treatment with alternative treatment options to the patient	46%	– 69 %	– 23 %	M
RE 4	A polite attitude of the staff towards the visitors	59%	– 53 %	6 %	O
RE 5	**Reach and communicate with the hospital without busy phone lines**	**54%**	– 32 %	21 %	I
RE 6	Patients are informed of the length of hospitalization	50%	– 52 %	– 2 %	M
RE 7	Response of the team towards the delay in physician visits by intimating the reasons	61%	– 32 %	29 %	A
RE 8	Patient requirements are met in the best interest of the management by the staff	69%	– 37 %	31 %	A
RE 9	Appropriate instructions are given for the lab/radiological diagnosis in advance by the staff	49%	– 64 %	– 16 %	M
	ASSURANCE				
AS 1	Hospital staff creates trust and physical and financial security in the patient	43%	– 62 %	– 19 %	M
AS 2	Informed of the treatment plan, the doctor recommended a second opinion	52%	– 35 %	17 %	I
AS 3	Patients are treated fairly and equally without discrimination by the staff	32%	– 74 %	– 42 %	M
AS 4	Doctors, nurses, and pharmacist explains the prescribed medication and the instructions for taking the medication correctly	47%	– 62 %	– 15 %	M
AS 5	The service provided is clinically compatible, and if the service made patients feel safe on an ongoing basis	41%	– 74 %	– 33 %	M
AS 6	Procedural attempts done multiple times by the staff are ensured by a supportive climate in promptly addressing errors	38%	– 71 %	– 33 %	M
AS 7	Possible problems and shortcomings fixed by the staff on time	57%	– 40 %	17 %	A
AS 8	The patient examination is carried out by the medical staff at the appropriate time as intimated by the nurses to the patient	56%	– 26 %	31 %	I
	EMPATHY				
EM 1	Emotional support is given to the patients by the staff	55%	– 44 %	10 %	I
EM 2	Hospital departments could provide appropriate services as per the specified operating hours	58%	– 51 %	7 %	O
EM 3	Visiting hours are convenient for	45%	– 51 %	– 6 %	M
EM 5	**Staff empathizes with the patient**	**58%**	– 43 %	15 %	A
EM 6	The staff builds a good rapport with the patients and addresses them by their names	53%	– 51 %	2 %	M

CS-Customer Satisfaction, DS-Customer Dissatisfaction, TSI-Total Satisfaction Index (**Source:** Primary data)
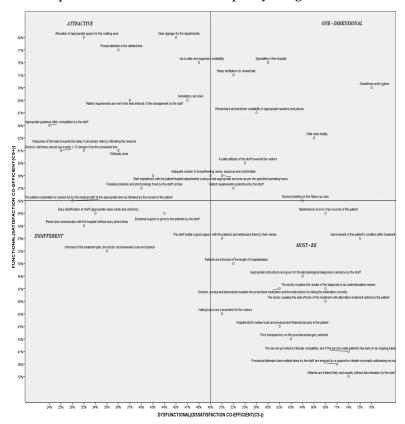
FIGURE 1. Two- dimensional representation of Kano service quality categories

(**Source:** Primary data)

The study conducted a thorough analysis using the Kano model to assess customer satisfaction with various service attributes in the hospital. To determine the statistical significance of differences in Customer Satisfaction (CS+) and Customer Dissatisfaction (DS-) percentages for each attribute, the researchers employed the Modified Fong Test and Blauths Test.

In the Modified Fong Test, the absolute value of the difference (|a-b|) between the most frequent and second most frequent responses was calculated to derive the Q value. Attributes with Q values exceeding the critical value at a 95% confidence interval were considered statistically significant, indicating a significant impact on customer satisfaction.

The Blauths Test was then used to categorize the attributes based on their Q values. Attributes with Q values higher than the critical value were classified as Attractive (A), suggesting that they contribute to customer delight. One-Dimensional (O) attributes had lower Q values, indicating a direct connection to customer satisfaction but with the potential for dissatisfaction if not fulfilled adequately. Must-Be (M) attributes, with the highest DS- percentages, were deemed crucial for meeting fundamental customer expectations.

Table 3 presents the statistical significance of attribute categorization in the Kano model for various service attributes. The study utilized the Modified Fong Test and Blauth's Test to assess the significance of differences between Customer Satisfaction (CS+) and Customer Dissatisfaction (DS-) percentages for each attribute.

Analyzing the results, it is evident that some attributes were categorized as Attractive, indicating high levels of customer satisfaction. These attributes, such as the child play area and allocation of appropriate waiting space, contribute positively to the overall service experience. Additionally, attributes categorized as One-Dimensional have relatively high CS+ percentages but higher DS- percentages, suggesting that they can lead to dissatisfaction if not adequately addressed.

The implementation of the Modified Fong Test and Blauth's Test in the study provides valuable insights into customer preferences and the significance of various attributes on satisfaction levels. By understanding the statistical significance of different features, the hospital can prioritize improvements and strategically enhance service offerings to deliver exceptional patient experiences.

In summary, the study's use of the Modified Fong Test and Blauth's Test allows for a comprehensive analysis of customer satisfaction and dissatisfaction with various attributes. By identifying statistically significant attributes, the hospital can focus on enhancing areas that significantly impact customer satisfaction and ensure better service delivery. This approach empowers the hospital to make informed decisions and deliver high-quality healthcare services that align with customer needs and expectations.

TABLE 3. Statistical significance of the attribute categorization of the Kano model

SERVICE ATTRIBUTES	MOST FREQUENT RESPONSE	SECOND MOST FREQUENT	|a-b|		Q (@95 % C.I)	MODIFIED FONG TEST	O+A+M		I+R+Q	BLAUTHS TEST	FINAL CATEGORY SERVICE ATTRIBUTES
TA1	47(A)	33(O)	14	>	13.91	Yes	97	>	11	Yes	A
TA2	43(O)	38(A)	5	<	13.95	No	102	>	6	Yes	O
TA3	56(O)	26(M)	30	>	13.98	Yes	102	>	6	Yes	O
TA4	46(A)	23(I)	23	>	13.43	Yes	85	>	23	Yes	A
TA5	38(A)	28(M)	10	<	13.27	No	91	>	17	Yes	A
TA6	38(O)	33(M)	5	<	13.53	No	100	>	8	Yes	O
TA7	62(A)	24(O)	38	>	14.10	Yes	97	>	11	Yes	A
TA8	53(A)	33(O)	20	>	14.10	Yes	102	>	6	Yes	A
TA9	44(A)	33(O)	11	<	13.80	No	100	>	8	Yes	A
TA10	40(A)	32(O)	8	>	13.58	No	101	>	7	Yes	A
TA11	43(A)	32(O)	11	<	13.71	No	94	>	14	Yes	A
TA12	46(A)	25(I)	21	>	13.53	Yes	83	>	25	Yes	A
RL1	40(M)	32(A)	8	<	13.58	No	101	>	7	Yes	M
RL2	56(A)	26(O)	30	>	13.98	Yes	95	>	13	Yes	A
RL3	41(M)	34(O)	7	<	13.71	No	100	>	8	Yes	M
RL4	51(M)	28(A)	23	>	13.87	Yes	96	>	12	Yes	M
RL5	48(M)	32(O)	16	>	13.91	Yes	105	>	3	Yes	M
RL6	48(A)	32(I)	16	>	13.91	Yes	75	>	33	Yes	A
RE1	59(A)	23(I)	36	>	13.98	Yes	85	>	23	Yes	A
RE2	51(M)	28(A)	23	>	13.87	Yes	102	>	6	Yes	M
RE3	52(M)	27(A)	25	>	13.87	Yes	102	>	6	Yes	M
RE4	38(A)	31(M)	7	<	13.43	No	95	>	13	Yes	A
RE5	37(A)	36(I)	1	<	13.63	No	72	>	36	Yes	A
RE6	35(M)	33(A)	2	<	13.38	No	89	>	19	Yes	M
RE7	46(A)	27(I)	19	>	13.63	Yes	81	>	27	Yes	A
RE8	55(A)	21(M)	34	>	13.76	Yes	95	>	13	Yes	A
RE9	**47(M)**	**30(A)**	**17**	**>**	**13.80**	**Yes**	**99**	**>**	**9**	**Yes**	**M**
AS1	48(M)	27(A)	21	>	13.71	Yes	94	>	14	Yes	M
AS2	43(A)	27(I)	16	>	13.48	Yes	81	>	27	Yes	A
AS3	62(M)	18(O)	44	>	13.91	Yes	97	>	11	Yes	M
AS4	48(M)	32(A)	16	>	13.91	Yes	98	>	10	Yes	M
AS5	58(M)	22(O)	36	>	13.91	Yes	102	>	6	Yes	M
AS6	56(M)	21(O)	35	>	13.80	Yes	97	>	11	Yes	M
AS7	38(A)	26(I)	12	>	13.15	Yes	81	>	27	Yes	A
AS8	45(A)	35(I)	10	<	13.91	No	73	>	35	Yes	A
EM1	46(A)	35(M)	11	<	13.9	No	94	>	14	Yes	A
EM2	38(A)	30(M)	8	<	13.38	No	93	>	15	Yes	A
EM3	42(M)	36(A)	6	<	13.84	No	90	>	18	Yes	M
EM4	41(A)	36(M)	5	<	13.80	No	97	>	11	Yes	A
EM5	43(A)	27(M)	16	>	13.48	Yes	89	>	19	Yes	A
EM6	38(A)	36(M)	2	<	13.67	No	92	>	16	Yes	A

TA-Tangibility, RL-Reliability, RE-Responsiveness, AS-Assurance, EM- Empathy, A-Attractive, O- One-

dimensional, M-Must-be, Q- Questionable, R- Reverse, I- Indifferent, Q-Significance level (95 %), C.I - Confidence interval, a most frequent response, b- second most frequent response (**Source:** Primary data)

The analysis of patient safety culture provides an extensive overview of the demographic details of participating nurses. The majority of respondents were female nurses, and a significant portion worked more than 40 hours per week. The age group of 26-30 years had the highest representation among female nurses. Nursing Superintendent and Assistant Nursing Superintendent were the most common positions among male and female nurses, respectively. In terms of education, most female nurses had undergraduate qualifications, while many male nurses held post-graduate degrees. Concerning work experience, a considerable proportion of female nurses had more than 1 to 2 years, while many male nurses had less than 1 year. Additionally, a significant percentage of female nurses received sufficient patient safety training, whereas many male nurses indicated a need for such training. Notably, a vast majority of female nurses had direct patient contact, compared to a smaller percentage of male nurses who reported no direct contact.

The analysis of patient safety culture dimensions reveals various aspects of how nurses perceive their work settings. Teamwork was generally perceived positively, with nurses acknowledging effective collaboration during busy times, but some expressed concerns about disrespectful behaviour within units. In terms of staffing and work pace, some nurses reported long working hours affecting patient care, while others felt there were enough staff to handle the workload. Organizational learning and continuous improvement were recognized as areas of strength, but some nurses believed that the same patient safety problems persisted. Response to errors and supervisor/manager support for patient safety was perceived positively, but there were concerns about mistakes being held against staff and feeling pressured to work faster during busy times. Hospital management's actions demonstrated a top priority for patient safety, but some nurses felt interest heightened only after adverse events. Handoffs and information exchange were areas for improvement, with important information sometimes being left out during patient transfers and shift changes. Communication about errors was mostly effective, but there were apprehensions about asking questions when something seemed amiss. Reporting of patient safety events varied among nurses. Overall, the majority rated their unit positively in terms of patient safety. These results provide valuable insights for targeted interventions and improvements to enhance patient safety culture and ensure safe and high-quality healthcare delivery.

The regression analyses aimed to assess the relationship between patient safety culture and patient satisfaction across various dimensions, including Tangibility, Reliability, Responsiveness, Assurance, and Empathy. Each dimension was evaluated for both its functional and dysfunctional aspects. The results in Table 4 revealed varying degrees of association between patient satisfaction and patient safety culture in different dimensions. Among the dimensions analyzed, Assurance _ Functional and Tangibility_Dysfunctional demonstrated relatively stronger associations, indicating that a positive patient safety culture may enhance assurance in healthcare services while a lack of tangibility can lead to patient dissatisfaction. On the other hand, dimensions like Reliability _ Functional and Responsiveness _ Dysfunctional exhibited weaker associations, suggesting that patient safety culture may have a limited impact on these specific aspects of patient satisfaction.

The regression equations for each dimension were as follows:

- Tangibility _Functional: TANGIBILITY FUNC = 2.478 + 0.226 * PAT_SAFETY_CULTURE

- Tangibility_Dysfunctional: TANGIBILITY_DYSFUNC = 4.079 - 0.358 * PAT_SAFETY_CULTURE

- Reliability_ Functional: RELIABILITY_FUNC = 2.919 + 0.011 * PAT_SAFETY_CULTURE

- Reliability _ Dysfunctional: RELIABILITY_DYSFUNC = 4.144 - 0.380 * PAT_SAFETY_CULTURE

- Responsiveness_ Functional: RESPONSE_FUNC = 1.884 + 0.288 * PAT_SAFETY_CULTURE

- Responsiveness_ Dysfunctional: RESPONSE_DYSFUNC = 2.652 + 0.065 * PAT_SAFETY_CULTURE

- Assurance_ Functional: ASSURANCE_FUNC = 2.061 + 0.230 * PAT_SAFETY_CULTURE

- Assurance_ Dysfunctional: ASSURANCE_DYSFUNC = 4.334 - 0.425 * PAT_SAFETY_CULTURE

- Empathy_ Functional: EMPATHY_FUNC = 1.728 + 0.317 * PAT_SAFETY_CULTURE

- Empathy_ Dysfunctional: EMPATHY_DYSFUNC = 3.611 - 0.212 * PAT_SAFETY_CULTURE

Overall, the regression analyses suggest that patient safety culture can have a measurable impact on certain aspects of patient satisfaction. Dimensions like Assurance and Tangibility, in their respective functional and dysfunctional forms, showed notable correlations with patient safety culture. These findings emphasize the importance of fostering a positive patient safety culture in healthcare organizations to enhance patient satisfaction, particularly in areas where the association was found to be stronger. However, in some dimensions, such as Reliability and Responsiveness, the influence of patient safety culture on patient satisfaction may be less pronounced. Therefore, while patient safety culture can contribute to improving certain aspects of patient satisfaction, its impact may vary across different dimensions of patient experiences. Healthcare providers can use these insights to identify areas for targeted improvement and better align patient safety efforts with enhancing overall patient satisfaction.

TABLE 4. Regression analysis between patient satisfaction and patient safety culture

TANGIBILITY

Dependent Variable: TANGIBILITY_FUNC	Independent variable: PAT_SAFETY_CULTURE

						Model Summary		**Parameter Estimates**

Equation	R Square	F	df1	df2	Sig.	Constant	b1
Linear	.027	1.965	1	72	.165	2.478	.226

Dependent Variable: TANGIBILITY_DYSFUNC	Independent variable: PAT_SAFETY_CULTURE

Linear	.018	1.345	1	72	.250	4.079	-.358

RELIABILITY

Dependent Variable: RELIABILITY_FUNC Independent variable: PAT_SAFETY_CULTURE

Linear	.000	.002	1	72	.967	2.919	.011

Dependent Variable: RELIABILITY_DYSFUNC Independent variable: PAT_SAFETY_CULTURE

Linear	.014	1.050	1	72	.309	4.144	-.380

RESPONSIVENESS

Dependent Variable: RESPONSE_FUNC	Independent variable: PAT_SAFETY_CULTURE

Linear	.015	1.105	1	72	.297	1.884	.288

Dependent Variable: RESPONSE_DYSFUNC				Independent variable: PAT_ SAFETY_CULTURE		
Linear	.001	.037	1	72	.848	2.652	.065

ASSURANCE

Dependent Variable: ASSURANCE_FUNC Independent variable: PAT_ SAFETY_CULTURE

Linear	.009	.643	1	72	.425	2.061	.230

Dependent Variable: ASSURANCE_DYSFUNC Independent variable: PAT_ SAFETY_CULTURE

Linear	.020	1.462	1	72	.231	4.334	-.425

EMPATHY

Dependent Variable: EMPATHY_ FUNC				Independent variable: PAT_ SAFETY_CULTURE		
Linear	.015	1.131	1	72	.291	1.728	.317

Dependent Variable: EMPATHY_ DYSFUNC				Independent variable: PAT_ SAFETY_CULTURE		
Linear	.004	.318	1	72	.575	3.611	-.212

FUNC- Functional, DYSFUNC- Dysfunctional, PAT- Patient (**Source:** Primary data)

3.1   Discussions

The study's comprehensive analysis of patient safety culture and its impact on patient satisfaction has provided valuable insights for the healthcare industry. The results indicate a significant relationship between patient safety culture and patient satisfaction, underscoring the importance of fostering a strong safety culture to enhance the overall patient experience. The study's novelty lies in its focus on pediatric patient attendees and the provider's stance on quality care by balancing the perception and expectations, shedding light on the unique considerations and needs of this vulnerable population.

From the government's viewpoint, the study's findings emphasize the need for targeted policies and initiatives to promote patient safety culture, especially in pediatric healthcare settings. Policymakers must recognize the significance of a safety culture in ensuring the well-being of children and their families during medical care. By strengthening safety practices and communication, governments can improve the quality of pediatric healthcare and enhance patient satisfaction (Alabdaly, A. et al., 2018).

A positive patient safety culture directly influences their perception of care quality and safety. Families seeking care for their children seek reassurance and trust in the healthcare system. A robust safety culture can alleviate concerns and foster confidence in the provided care. Moreover, healthcare providers' attentiveness to safety and open communication can create a positive patient experience for the child and their family, increasing overall satisfaction (Braithwaite et al., 2017). The study's insights have significant implications for healthcare providers attending to pediatric patients.

Understanding the impact of patient safety culture on this population is crucial. Providers must be aware of the

unique needs of young patients and strive to foster an environment that prioritizes their safety and comfort. By integrating patient safety practices and promoting open communication with patients and families, providers can enhance the overall pediatric healthcare experience and contribute to increased patient satisfaction (Mueller et al., 2019).

Investing in patient safety culture in pediatric healthcare settings can lead to long-term cost savings. A strong safety culture can help reduce medical errors and prevent adverse events, resulting in improved patient outcomes and reduced healthcare costs (Braithwaite et al., 2017). Additionally, a positive patient experience for pediatric patients and their attendees can contribute to higher patient retention and positive word-of-mouth referrals, ultimately benefiting the healthcare facility economically (Doyle et al., 2013).

4   CONCLUSION, IMPLICATIONS AND SUGGESTIONS

4.1   Conclusion

In conclusion, this study sheds light on crucial aspects of patient safety culture and patient satisfaction in healthcare settings. The findings underscore the significance of fostering a safety culture within healthcare organizations to promote patient well-being and improve overall healthcare experiences. By prioritizing patient safety through robust reporting systems, training programs, and open communication, healthcare providers can reduce medical errors and enhance patient trust in the system.

Moreover, the study reveals key factors influencing patient satisfaction, such as effective communication, reduced waiting times, and patient-centred care approaches. Addressing these factors can lead to higher patient satisfaction, increased patient engagement, and improved healthcare outcomes. Healthcare organizations must strive to enhance communication between healthcare providers and patients and create a conducive physical environment in facilities to better cater to patient needs.

Furthermore, the study highlights the importance of transparency and accessibility in healthcare services. By providing clear and transparent information about healthcare services and leveraging technology for improved access and convenience, healthcare organizations can empower patients to make informed decisions about their health.

The study's insights provide valuable guidance for healthcare providers in their journey towards patient-centred care. It emphasizes the continuous evaluation and adaptation of interventions to meet evolving patient needs and preferences. By implementing the suggested strategies, healthcare organizations can create a safer and more patient-centric healthcare system, fostering trust and satisfaction among patients.

In moving forward, future research can explore the long-term impact of these interventions on patient outcomes and healthcare utilization, helping identify areas for further improvement. Additionally, investigating potential challenges and barriers to implementing these strategies will offer valuable insights for successful adoption in diverse healthcare settings.

In essence, this study serves as a stepping stone towards a healthcare system that prioritizes patient safety, satisfaction, and overall well-being. By embracing patient- centred approaches and continuous improvement, healthcare providers can deliver high- quality care and create meaningful impacts on patient experiences.

4.2   Implications of the Research

The implications of this research hold significance for both healthcare providers and patient attendees. For healthcare providers, the study underscores the importance of establishing a robust safety culture within healthcare settings. Providers should prioritize open communication, reporting of errors, and continuous learning to reduce medical errors and enhance patient safety. Moreover, enhancing communication skills among healthcare providers can lead to better patient-provider interactions, increased patient understanding of treatment plans, and higher levels of patient satisfaction. Providers should also focus on reducing waiting times and streamlining processes to improve patient experiences. Embracing patient-centred care and involving patients in decision- making processes empowers patients and enhances their satisfaction with healthcare services. Regular evaluation of patient satisfaction data and implementation of improvement initiatives are essential for continuous quality enhancement. Additionally, leveraging technology to improve access to healthcare services and patient convenience can further enhance patient satisfaction. For patient attendees, the research highlights the importance of being active

participants in their healthcare journey. Patients should prioritize open communication with healthcare providers and be proactive in discussing their preferences and concerns. Seeking healthcare services from organizations that prioritize patient safety and satisfaction can lead to a better overall healthcare experience. Patient attendees should also take advantage of technology-driven solutions to access healthcare services conveniently. By being informed and engaged, patients can play a significant role in shaping their healthcare experiences and contribute to the improvement of the healthcare system as a whole.

4.3   Limitations and directions for future research

This study has several limitations that should be acknowledged. Firstly, the research was conducted in a single healthcare facility, which may restrict the generalizability of the findings to other settings. Different healthcare environments may have diverse organizational cultures, patient populations, and resource availability, potentially influencing the study outcomes differently. Conducting similar research in multiple settings would offer a more comprehensive and representative sample to address this limitation. Secondly, the statistical analysis conducted using SPSS software was limited to percentage analysis and regression analysis. While SPSS is a widely-used tool, more advanced statistical techniques, such as structural equation modelling or hierarchical modelling, could provide deeper insights into the proposed model and its complexities. Lastly, the study faced time constraints associated with data collection, potentially limiting the scope and depth of the analysis. Despite these limitations, the study's findings still provide valuable insights into patient safety culture, patient satisfaction, and consumer choice of healthcare, laying the groundwork for future research and improvement in healthcare systems.

Future research should prioritize evaluating the effectiveness of interventions aimed at enhancing patient safety culture, patient satisfaction, and consumer choice of healthcare. Conducting longitudinal studies will provide valuable insights into the long- term impact of these interventions, allowing for the identification of best practices for sustained improvements. Additionally, further investigation is warranted to explore the influence of co-creation tools and quality improvement technologies on patient outcomes and organizational performance. Studying the implementation and effectiveness of these tools in diverse healthcare settings will shed light on potential barriers, facilitators, and best practices for successful adoption. Furthermore, research should delve into the role of technology in healthcare and its impact on patient safety, satisfaction, and consumer choice. This includes investigating the potential benefits and challenges associated with artificial intelligence, data analytics, and telehealth solutions to enhance patient experiences and overall healthcare outcomes. By addressing these research directions, the healthcare industry can continuously evolve to meet the dynamic needs and expectations of patients and providers alike.

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