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Understanding Patient Satisfaction Using SERVQUAL-Kano: The Moderating Role of Patient Trust and the Mediating Role of Waiting Time Tolerance

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Abstract

This study examines factors influencing patient satisfaction at private primary healthcare facilities (FKTP) in Bali, focusing on SERVQUAL dimensions, waiting time tolerance, patient trust, and Kano model attributes. Using a quantitative design and Partial Least Squares Structural Equation Modelling (PLS-SEM) on data from 188 respondents, the study found that assurance and patient safety significantly influence patient satisfaction, while tangibility, reliability, empathy, and responsiveness did not show significant effects. Assurance and responsiveness positively influence waiting time tolerance, which itself positively influences satisfaction. Waiting time tolerance did not mediate the relationship between SERVQUAL dimensions and satisfaction. Patient trust did not directly influence patient satisfaction but negatively moderated the impact of tangibility on satisfaction. Kano model attributes – categorized as attractive, one-dimensional, and must-be – showed no significant direct effect on satisfaction, reflecting their asymmetric and non-linear nature. The findings suggest that private FKTP should prioritize maintaining high assurance and patient safety standards alongside attractive features such as 24-hour service and patient feedback systems. Integrating patient safety into the SERVQUAL framework is recommended in the healthcare sector. Future research should explore patient satisfaction through longitudinal and qualitative approaches to better capture the dynamic nature of healthcare service quality.

Keywords: SERVQUAL, Kano Model, Patient Satisfaction, Waiting Time Tolerance, Patient Trust, Patient Safety.

1. Introduction

The Indonesian healthcare sector is uniquely shaped by its diverse geography, socioeconomic status, culture, and regulatory environment (Laksono & Wulandari, 2021; Setiawan et al., 2021; Harapan et al., 2023). This uniqueness, especially during COVID-19, created challenges for patients, medical staff, and policymakers (Harapan et al., 2023). Furthermore, there is a disparity between private and public healthcare facilities. In 2014, the National Health Insurance (JKN) program by BPJS was introduced, which mandates accreditation and introduces competition by allowing patients to freely choose and change primary healthcare providers (FKTP). In provinces such as Bali, both enrollment in BPJS and the number of private healthcare facilities have grown rapidly over recent years, intensifying competition among providers. The number changed from 119 in 2021 to 208 in 2023 (Kemenkes, 2022; Kemenkes, 2023; Kemenkes, 2024).

Patient satisfaction is key to the success of healthcare services and is defined by how well service performance meets or exceeds patient expectations (Kotler & Keller, 2016). Service quality, frequently measured with the SERVQUAL model, which includes tangibility, reliability, assurance, responsiveness, and empathy, directly influences satisfaction (Nascimento et al., 2024; Lesmana & Balqiah, 2023; Javed & Ilyas, 2018; Ratnawati et al., 2020; Al-Balas et al., 2024; Al-Hilou & Suifan, 2023; George & Sahadevan, 2024). However, previous studies have noted that SERVQUAL dimensions have limitations in the healthcare sector and suggested adding dimensions such as patient safety (Endeshaw, 2021; Ali et al., 2023; Ali et al., 2024), which is now a significant component of clinic accreditation and a critical determinant of satisfaction (Kalaja et al., 2023; Mistri et al., 2023).

The Kano model, introduced by Noriaki Kano in 1984, classifies service attributes according to their impact on customer satisfaction, enabling health care facilities to identify and enhance areas requiring improvement (Materla et al., 2019; Chen et al., 2022; Kermanshachi et al., 2022). However, previous studies have been limited in quantitatively measuring this model. These limitations have created a gap in examining the direct relationship between the Kano model (specifically customer requirements) and patient satisfaction.

One potential challenge in healthcare services is waiting time, which has been shown to negatively affect patient satisfaction (Yousefi et al., 2020; Sarwat, 2022). According to regulations, the maximum permissible waiting time for outpatient patients is ≤ 60 minutes (Kepmenkes No.129/2008). Previous studies also highlight that subjective waiting time, including patients' tolerance for waiting, is significantly related to patient

satisfaction (Zhang et al., 2023). Therefore, it is important to examine how SERVQUAL attributes influence waiting time tolerance and, in turn, their impact on patient satisfaction.

Moreover, patient trust also plays a critical role. Trust, defined as the willingness to be vulnerable to others' actions (Mayer et al., 1995), has been proven to enhance patient satisfaction in several studies. This study, however, attempts to determine the moderating effect of patient trust in the relationship between SERVQUAL dimensions and patient satisfaction. (Al-Hilou & Suifan, 2023; Zhou et al., 2024).

Building on the limitations of previous studies, particularly regarding SERVQUAL dimensions in the healthcare sector, this study aims to comprehensively examine the factors influencing patient satisfaction. It focuses on SERVQUAL dimensions while also considering the inclusion of patient safety as an additional dimension, as well as the roles of waiting time tolerance and patient trust. Specifically, the study investigates the effects of SERVQUAL-Kano attributes on patient satisfaction, with patient trust serving as a moderator and waiting time tolerance as a mediator in primary healthcare (FKTP).

2. Literature Review

2.1. Expectancy-Disconfirmation Theory

Expectancy Disconfirmation Theory (EDT) was developed by Richard L. Oliver in 1980. This theory posits that customer satisfaction arises from the comparison between pre-purchase expectations and post-purchase product or service performance. Satisfaction occurs when actual performance meets or exceeds expectations, producing positive disconfirmation. Conversely, when performance falls short of expectations, negative disconfirmation leads to dissatisfaction. The theory emphasizes the role of consumers' expectations and perceived performance in shaping satisfaction and subsequent repurchase decisions (Oliver, 1980).

The model involves three key constructs: expectations, disconfirmation, and satisfaction. The theory is widely employed in consumer behavior research to examine satisfaction and loyalty across various industries. It views satisfaction as a cognitive process shaped by the comparison between expected and experienced performance (Oliver, 1980).

2.2. Service Quality

Service quality is a measure of how well a company's services meet or exceed customer expectations (Parasuraman et al., 1988). Service quality becomes an important factor in retaining customers and creating high customer satisfaction. According to Kotler and Keller (2016), service quality encompasses the overall characteristics and attributes of a service that determine its ability to satisfy customer needs. When a product or service performs as expected, customers experience satisfaction; if it falls short, they are likely to be disappointed.

SERVQUAL, developed by Parasuraman et al. (1988), is a method for assessing service quality. The model evaluates service quality by comparing customers' expectations (expected service) with their perceptions (perceived service) of the service they receive. SERVQUAL consists of five dimensions of measurement, namely:

1. Tangible: The physical form of a product or service, covering facilities, equipment, and personnel.
2. Reliability: The ability to deliver service performance consistently and accurately.
3. Responsiveness: The willingness to assist customers and provide prompt service.
4. Assurance: The knowledge and competence of staff in performing their work and their ability to build customer trust.
5. Empathy: The caring and individualized attention given to customers.

According to Cronin and Taylor (1992), the SERVQUAL model can be assessed using an alternative approach called SERVPERF. SERVPERF utilizes the same dimensions, indicators, and measurement items as SERVQUAL but focuses solely on measuring the actual performance of services. This approach maintains validity while offering greater efficiency.

2.3. Kano Model

The Kano Model, developed by Noriaki Kano and his team in 1984, was designed to classify and prioritize customer needs, providing guidance for companies in meeting those needs (Rotar & Kozar, 2017). The model generally divides customer needs into two main dimensions: the provider dimension and the customer dimension. In the provider dimension, needs are categorized as must-be (basic) and one-dimensional or attractive, while in the customer dimension, they are classified as indifferent, questionable, or reverse (Berger et al., 1993).

Based on customer responses and expectation levels, the model is divided into three main categories: basic needs (must-be), performance needs, and attractive (delight) needs. In the must-be or basic needs category, if the performance meets or exceeds expectations, customers tend to be neutral. However, if it fails to meet expectations, customers will feel dissatisfied or disappointed. In the performance needs category, customer

satisfaction increases as the level of a product's or service's performance rises, reflecting the "the more, the better" principle.

The attractive or delightful needs category refers to features provided by the product or service provider that customers do not initially expect. This results in a pleasant surprise for customers and makes them feel extremely satisfied or even delighted (Rotar & Kozar, 2017). Additionally, there are three other categories: indifferent, which means the feature does not affect customer satisfaction whether it is present or not; reverse, which occurs when a feature causes dissatisfaction when given; and questionable, which means the feature is invalid because customers simultaneously express satisfaction when it is present and no dissatisfaction when it is absent (Berger et al., 1993).

2.4. Patient Satisfaction

In general, satisfaction is a feeling of pleasure or disappointment that results from comparing a product or service to expectations. If the performance of the product or service falls short of what the customers expect, they will feel dissatisfied or disappointed. If the performance meets expectations, they will be satisfied, and if the performance exceeds expectations, they will feel very satisfied (Kotler & Keller, 2016). Many companies monitor customer satisfaction and evaluate how effectively they serve their customers. Customer satisfaction is a key factor in determining whether customers continue to use a company's products or services.

2.5. Relationship between SERVQUAL and Patient Satisfaction

The SERVQUAL model, which comprises five dimensions: tangible, assurance, empathy, reliability, and responsiveness, has been widely examined for its impact on customer satisfaction. Xie and Ma (2023), in their study "Research on the Service Quality of Emergency Medical Language Services during Major Unexpected Public Health Events," applied the SERVQUAL model to evaluate service quality in Emergency Medical Language Services. They found that reliability, responsiveness, and tangible influenced customer satisfaction, with tangible having a negative effect, while empathy and assurance showed no significant impact.

However, research by Alsheyadi and Albalushi (2020) on the relationship between SERVQUAL dimensions and student service satisfaction found that all five dimensions, tangible, responsiveness, assurance, reliability, and empathy, positively influenced satisfaction. Similarly, Kalaja et al. (2023) examined the effects of tangible, responsiveness, safety, reliability, and empathy on patient satisfaction and reported positive impacts for all five dimensions. This conclusion is further supported by Botchwey et al (2024), who found that incorporating patient safety enhances patient satisfaction. Based on these findings, the following hypotheses are proposed:

H_1a: SERVQUAL dimension, tangible influences patient satisfaction.
H_1b: SERVQUAL dimension assurance influences patient satisfaction.
H_1c: SERVQUAL dimension reliability influences patient satisfaction.
H_1d: SERVQUAL dimension patient safety influences patient satisfaction.
H_1e: SERVQUAL dimension empathy influences patient satisfaction.
H_1f: SERVQUAL dimension responsiveness influences patient satisfaction.

2.6. Relationship between SERVQUAL and Waiting Time Tolerance

Ting et al. (2019) investigated the relationship between service recovery, willingness to pay, and willingness to wait, finding that tangible, one of the SERVQUAL dimensions, can increase customers' willingness to wait longer. This finding underscores the need to explore how other SERVQUAL dimensions may relate to waiting time tolerance in the healthcare sector, an area where research remains limited.

Additionally, Jabour (2020) investigated the impact of consultation duration on waiting time and patient satisfaction, demonstrating that consultation length reflects how service quality can influence waiting time. This finding highlights the need for further research on this relationship. Based on this discussion, the following hypotheses are proposed:

H_2a: SERVQUAL dimension, tangible influences waiting time tolerance.
H_2b: SERVQUAL dimension assurance influences waiting time tolerance.
H_2c: SERVQUAL dimension reliability influences waiting time tolerance.
H_2d: SERVQUAL dimension patient safety influences waiting time tolerance.
H_2e: SERVQUAL dimension empathy influences waiting time tolerance.
H_2f: SERVQUAL dimension responsiveness influences waiting time tolerance.

2.7. Relationship between Waiting Time Tolerance and Patient Satisfaction

Sarwat et al. (2021), in a study titled "The Effects of Waiting Time and Satisfaction Among Patients Visiting Medical Outpatient Department of a Tertiary Care Hospital," found that waiting time is related to patient

satisfaction. Liu et al. (2020) also reported that waiting time negatively affects patient satisfaction; however, when waiting time remains within a patient's tolerance level, the effect can be slightly positive. Similarly, Zhang et al. (2023) demonstrated that subjective waiting time, including tolerance levels, is associated with outpatient satisfaction. Based on these findings, the following hypothesis is proposed:

H_3: Waiting time tolerance influences patient satisfaction.

2.8. Relationship between Patient Trust and Patient Satisfaction

A study by Zhou et al. (2024), titled "The Impact of Medical Risk Perception on Patient Satisfaction: The Moderating Role of Shared Decision-Making," found that patient trust positively affects patient satisfaction. This result is supported by Venkatakrishnan et al. (2023), who found that trust positively influences customer satisfaction in the web design service sector. Based on these findings, the following hypothesis is proposed:

H_4: Patient trust influences patient satisfaction.

2.9. Mediating Role of Waiting Time Tolerance in the Relationship between SERVQUAL and Patient Satisfaction

As previously discussed, the SERVQUAL dimensions positively influence waiting time tolerance (Ting et al., 2019). The relationship between waiting time tolerance and patient satisfaction has also been examined by Liu et al. (2019) and Zhang et al. (2023). Based on these studies, higher service quality is conceptually expected to increase waiting time tolerance, which in turn affects patient satisfaction. This research proposes that waiting time tolerance acts as a mediating variable in the relationship between SERVQUAL and patient satisfaction. Therefore, the following hypotheses are formulated:

H_5a: Waiting time tolerance mediates the relationship between tangible and patient satisfaction.
H_5b: Waiting time tolerance mediates the relationship between assurance and patient satisfaction.
H_5c: Waiting time tolerance mediates the relationship between reliability and patient satisfaction.
H_5d: Waiting time tolerance mediates the relationship between patient safety and patient satisfaction.
H_5e: Waiting time tolerance mediates the relationship between empathy and patient satisfaction.
H_5f: Waiting time tolerance mediates the relationship between responsiveness and patient satisfaction.

2.10. Moderating Role of Patient Trust in the Relationship between SERVQUAL and Patient Satisfaction

Xie and Ma (2023), in their study "Research on the Service Quality of Emergency Medical Language Services during Major Unexpected Public Health Events," found that the SERVQUAL dimension of tangible negatively affects customer satisfaction, while empathy and assurance showed no significant impact. In contrast, Alsheyadi and Albalushi (2020) reported that all five SERVQUAL dimensions positively influence customer satisfaction.

Venkatakrishnan et al. (2023), in their study "Web Design and Trust as Moderators in the Relationship Between E-Service Quality, Customer Satisfaction and Customer Loyalty," found that trust serves as a moderator in the relationship between e-service quality, web design, and customer satisfaction.

Similarly, Teangsompong et al. (2024) reported that trust moderates the relationship between the service quality of Thai street food vendors and customer satisfaction. Drawing on these previous studies and the discussion above, the following hypotheses are proposed:

H_6a: Patient trust moderates the relationship between tangible and patient satisfaction.
H_6b: Patient trust moderates the relationship between assurance and patient satisfaction.
H_6c: Patient trust moderates the relationship between reliability and patient satisfaction.
H_6d: Patient trust moderates the relationship between patient safety and patient satisfaction.
H_6e: Patient trust moderates the relationship between empathy and patient satisfaction.
H_6f: Patient trust moderates the relationship between responsiveness and patient satisfaction.

2.11. Relationship between Customer Requirements and Patient Satisfaction

Zhou et al. (2024), in their study "Evaluating the Quality Factors Affecting Patient Satisfaction via the Kano Model," found that the Kano attributes attractive, one-dimensional, and must-be impact patient satisfaction, with the attractive attribute exerting the strongest influence. This result is corroborated by Hartono (2018), who observed that the Kano attributes attractive, one-dimensional, and must-be affect emotional (kansei) customer satisfaction. Based on this discussion, the following hypothesis is proposed:

H_7: Customer requirements influence patient satisfaction.

3. Methods

3.1. Research Design

This study uses quantitative methods with structural equation modelling approach using SMART PLS 4.0 application.

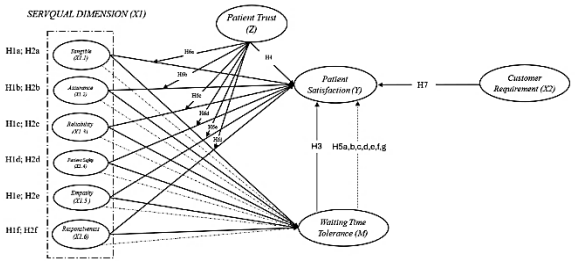

Figure 1. Research model

3.2. Location, Population, Sample and Sampling Technique

This study was carried out at private primary healthcare facilities (FKTP) in Bali. These sites were chosen due to the increasing number of private FKTP, which has heightened competition within the healthcare sector. Unlike public facilities, private healthcare providers are independently operated and not directly managed by the government, making it crucial for them to ensure high service performance and patient satisfaction.

The research population comprised patients visiting the selected FKTP. Participants were selected using non-probability purposive sampling. Inclusion criteria required patients or their companions to have received services at least twice and to be capable of completing the questionnaire independently. The sample size was determined following Hair et al. (2019), who recommend 5 to 10 respondents per indicator. Given the 37 indicators in this study, the required sample ranged from 185 to 370 respondents.

3.3. Data Collection Technique

This quantitative study utilized a survey method, collecting primary data through questionnaires. The questionnaires were distributed in printed form to patients or their companions at the research site, including those waiting in line, awaiting further examination, or who had received services but had not yet left the facility. Responses were recorded on a 1–10 scale, with one representing "strongly disagree/very dissatisfied" and 10 representing "strongly agree/very satisfied."

3.4. Data Analysis Technique

Data were analyzed using both descriptive and inferential methods. Descriptive analysis was conducted to examine respondent demographics, perceptions of each research variable, and the classification of SERVQUAL dimensions into Kano attributes. Inferential analysis was performed using Partial Least Squares Structural Equation Modeling (PLS-SEM) with SmartPLS 4.0, which included assessment of the measurement model (outer model, outer loadings, internal consistency reliability via Cronbach's alpha and composite reliability, convergent validity using AVE, and discriminant validity based on the Fornell–Larcker criterion) and the structural model (inner model, R^2). Hypothesis testing was carried out using the t-test, with relationships and mediation effects considered significant at $p < 0.05$ (Hair et al., 2022).

4. Result

4.1. Sample Characteristics

Table 1. Characteristics of respondents (n=188)

	Frequency	Percentage (%)
Gender		
Male	83	44,1
Female	105	55,9
Education		
Not Educated	0	0
Primary School	2	1,1
High School	96	51,1
University	90	47,9
Number of Visits In the Last 5 Years		
2-5 x	76	40,4
> 5 – 10x	90	47,9
>10x	22	11,7
Income		
< Rp. 2.500.000	40	21,3
Rp. 2.500.000- Rp. 5.000.000	121	64,4
> Rp. 5.000.000- Rp. 10.000.000	20	10,6
>Rp. 10.000.000	7	3,7
Age (Years)		
<17	2	1,1
17-27	79	42,0
28-43	95	50,5
44-60	11	5,9
> 60	1	0,5
Job		
Unemployed/ Housewife	13	6,9
Private Sector	139	73,9
Civil Servant/BUMN/PPPK	5	2,7
Entrepreneur	13	6,9
Student	18	9,6
Domicile		
Denpasar	141	75,0
Badung	28	14,9
Gianyar	6	3,2
Bangli	2	1,1
Tabanan	8	4,3
Buleleng	0	0
Jembrana	2	1,1
Karangasem	1	0,5
Klungkung	0	0
Payment Method		
BPJS	151	80,3
Private Insurance	14	7,4
Personal Expense	14	7,4
Others	9	4,8

This study was carried out at private Primary Healthcare Facilities (FKTP) in Bali, where questionnaires were distributed to patients and their companions. A total of 188 respondents participated. The characteristics of the respondents, based on the collected data, are presented in Table 1.

Based on the respondents' demographic data (Table 1), the majority were female (55.9%) and in the productive age ranges of 17–27 years (42%) and 28–43 years (50.5%). Most respondents were employed in the private sector (73.9%) and used BPJS Health Insurance as their payment method (80.3%), reflecting the high coverage of BPJS among Bali residents. In terms of education, nearly all respondents had completed at least high school (51.1%) or higher education (47.9%), with only 1.1% having elementary education, consistent with the inclusion criteria requiring respondents to complete the questionnaire independently. Most respondents were repeat visitors, having accessed services more than five times in the past five years (47.9%) or 2–5 times (40.4%), indicating familiarity with private FKTP services. The majority resided in Denpasar (75%) and Badung (14.9%), aligning with their status as Bali's capital and main tourism hub, respectively.

4.2. Kano Model

The Kano model classification is determined using functional and dysfunctional questions. Each respondent's classification is interpreted as follows:

- If the total of (one-dimensional + attractive + must-be) is greater than (indifferent + reverse + questionable), the category is assigned based on the highest value among (one-dimensional, attractive, must-be).
- If the total of (one-dimensional + attractive + must-be) is less than (indifferent + reverse + questionable), the category is assigned based on the highest value among (indifferent, reverse, questionable).
- If both totals are equal, the category is chosen from the highest value among all Kano categories.

In this study, three attributes were classified as attractive (A), twelve as must-be (M), and ten as one-dimensional (O). The attractive (A) attributes, all falling under the empathy dimension, include 24-hour operation, ease of providing feedback, and staff follow-up after service. These features enhance satisfaction and create positive surprises, but do not lead to strong dissatisfaction if absent. One-dimensional (O) attributes represent performance-related elements, where higher quality directly increases satisfaction. This study identified ten such attributes. Must-be (M) attributes are basic requirements, and their absence significantly reduces satisfaction. Examples include a pleasant clinic appearance, comfortable doctor rooms, services delivered as promised, staff responsiveness, accurate information, polite and careful medical personnel, fairness, effective communication, procedure confirmation, and safety facilities.

To gain a competitive advantage, private primary healthcare providers should emphasize attractive attributes to delight patients and foster loyalty, while ensuring that one-dimensional and must-be attributes are maintained to meet baseline satisfaction.

4.3. Inferential Statistic

The inferential analysis employed Structural Equation Modeling (SEM) based on variance, also known as Component-Based SEM or Partial Least Squares (PLS), using SmartPLS 4.0 software. This method was chosen because it is suitable for testing relationships among variables. In this study, 37 indicators were identified, of which 34 were reflective and 3 were formative, as shown in Table 2. During the validity and reliability testing of the outer models, some items were removed because they did not meet the criteria of AVE > 0.5 and cross-loading. The factor loadings are presented in Table 3, while internal reliability and convergent validity are shown in Table 4.

After performing cross-loading modifications, all indicators were found to load higher on their respective constructs than on others. Additionally, the Fornell–Larcker criterion results showed that each construct's value exceeded those of the other constructs, indicating that the variables exhibit good discriminant validity.

The inner model test assesses the relationships among constructs, hypothesis testing, and the R-Square value of the research model (Figure 2). The structural model is evaluated using the R-Square indicator, which indicates the extent to which exogenous variables influence endogenous variables.

The R-Square value ranges from 0 to +1. A value closer to +1 indicates that exogenous variables provide strong predictive information for endogenous variables. Conversely, a value close to 0 indicates that the predictive ability of exogenous variables remains limited. The R-squared for this study is shown in Table 5.

The R-Square value of 0.637 indicates that the exogenous variables account for 63.7% of the variation in patient satisfaction, while the remaining 36.3% is influenced by factors not included in this study. Similarly, an R-Square value of 0.419 shows that 41.9% of the variation in the waiting time tolerance variable is explained by exogenous variables, including tangible, reliability, responsiveness, assurance, empathy, and patient safety.

Table 2. Indicator

	Indicator	Explanation
Tangible	TA 1	Physical facilities, such as buildings, must be visually appealing
	TA 2	The doctor's examination room should be comfortable
	TA 3	Medical personnel should appear neat and tidy
	TA 4	The medical equipment used should be modern and well-maintained
Reliability	REL 1	Staff show interest in resolving patient issues
	REL 2	The service process is easy and clear.
	REL 3	The healthcare facility provides services as promised
	REL 4	Services are provided in accordance with Standard Operating Procedures (SOPs).
Responsiveness	RES 1	Staff provide accurate information to patients
	RES 2	Staff respond promptly to patient complaints or questions
	RES 3	The service process is fast
	RES 4	The consultation duration with medical personnel is adequate
Assurance	AS 1	The doctor's diagnosis and treatment are accurate
	AS 2	Medical personnel are meticulous in their work.
	AS 3	Medical personnel are friendly and polite during examinations
	AS 4	Medical personnel provide convincing explanations
Empathy	EMP 1	Staff serve patients regardless of their status
	EMP 2	Criticism and suggestions can be given easily
	EMP 3	Staff follow up on patient conditions after providing services
	EMP 4	The healthcare facility's opening hours provide comfort to patients
Patient Safety	PS 1	Patients are identified by at least their name and date of birth
	PS 2	Communication is effective
	PS 3	Procedures and locations of planned actions are confirmed
	PS 4	Staff use adequate personal protective equipment to prevent infection transmission
	PS 5	The healthcare facility has safety features to prevent patients from falling
Patient Trust	TRU 1	Competence
	TRU 2	Fidelity
	TRU 3	Honesty
Waiting Time Tolerance	WTT 1	Willingness to wait longer than the services received
	WTT 2	Patients' opinions if their waiting time exceeds the maximum standard outpatient waiting time (≤ 60 minutes)
	WTT 3	Perceived waiting time during the wait
Patient Satisfaction	SAT 1	Patient perception of overall satisfaction with healthcare services
	SAT 2	Patient perception of how well the healthcare services meet their expectations
	SAT 3	Patient perception of their willingness to recommend the healthcare facility to others

Table 3. Loading factor

	Indicator	Loading Factor		Indicator	Loading Factor
Tangible	TA 1	0.797	Patient Safety		
	TA 2	0.857			
	TA 3	0.801		PS 3	0.776
	TA 4	0.771		PS 4	0.720
Reliability	REL 1	0.769		PS 5	0.801
	REL 2	0.691	Patient Trust	TRU 1	0.858
	REL 3	0.786		TRU 2	0.688
				TRU 3	0.682
Responsiveness	RES 1	0.741	Waiting Time Tolerance	WTT 1	0.903
	RES 2	0.776		WTT 2	0.707
	RES 3	0.781		WTT 3	0.861
	RES 4	0.844	Patient Satisfaction	SAT 1	0.832
Assurance	AS 1	0.753		SAT 2	0.918
	AS 2	0.869		SAT 3	0.875
	AS 3	0.814			
	AS 4	0.778			
Empathy					
	EMP 2	0.889			
	EMP 3	0.708			
	EMP 4	0.757			

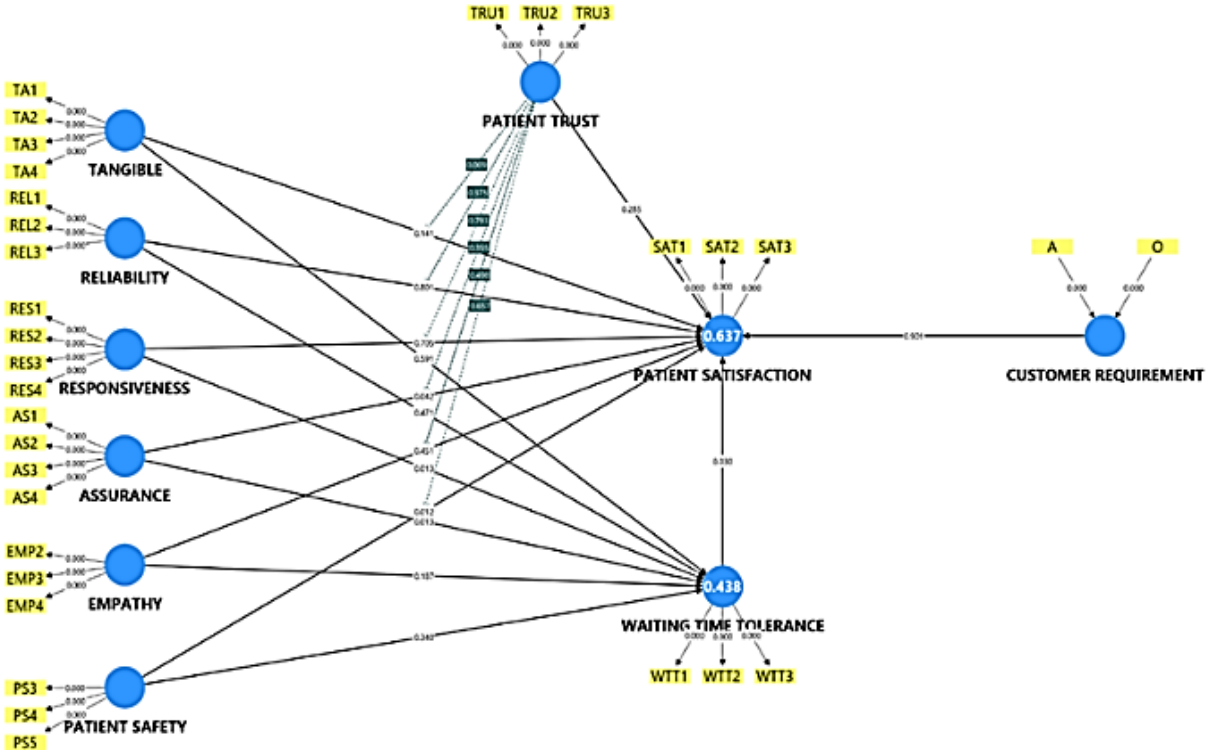

Figure 2. SmartPLS 4 analysis

Table 4. Internal reliability and convergent validity

	Cronbach alpha	AVE
Tangible	0.822	0.652
Reliability	0.610	0.562
Responsiveness	0.795	0.619
Assurance	0.817	0.647
Empathy	0.691	0.621
Patient Safety	0.648	0.588
Patient Trust	0.618	0.559
Waiting Time Tolerance	0.769	0.686
Patient Satisfaction	0.847	0.766

Table 5. R-Square

	R-Square	R-Square Adjusted	Category
Patient Satisfaction	0.637	0.605	Moderate
Waiting Time Tolerance	0.438	0.419	Moderate

Table 6 presents the results of the hypothesis tests between variables. Six hypotheses were accepted: H1b, H1d, H2b, H2f, H3, and H6a. A hypothesis is considered accepted or rejected based on the T-statistic value, with a threshold of 1.96 for acceptance. Additionally, hypothesis testing considers the p-value: an effect is deemed significant if the p-value is less than 0.05, and not significant if the p-value is greater than 0.05.

Table 7 presents the path coefficients for the accepted hypotheses. A positive sign indicates that the relationship between variables is in the expected direction: as the value of the exogenous variable increases, the value of the endogenous variable also increases.

Table 6. Hypothesis tests

	Hypothesis	T-statistic	p-value	
H1a	Tangible → Patient Satisfaction	1.471	0.141	Rejected
H1b	**Assurance → Patient Satisfaction**	**2.035**	**0.042**	**Accepted**
H1c	Reliability → Patient Satisfaction	0.252	0.801	Rejected
H1d	**Patient Safety → Patient Satisfaction**	**2.506**	**0.012**	**Accepted**
H1e	Empathy → Patient Satisfaction	0.753	0.451	Rejected
H1f	Responsiveness → Patient Satisfaction	0.379	0.705	Rejected
H2a	Tangible → Waiting Time Tolerance	0.537	0.591	Rejected
H2b	**Assurance → Waiting Time Tolerance**	**2.488**	**0.013**	**Accepted**
H2c	Reliability → Waiting Time Tolerance	0.721	0.471	Rejected
H2d	Patient Safety → Waiting Time Tolerance	0.955	0.340	Rejected
H2e	Empathy → Waiting Time Tolerance	1.321	0.187	Rejected
H2f	**Responsiveness → Waiting Time Tolerance**	**2.493**	**0.013**	**Accepted**
H3	**Waiting Time Tolerance → Patient Satisfaction**	**2.170**	**0.030**	**Accepted**
H4	Patient Trust → Patient Satisfaction	1.070	0.285	Rejected
H5a	Tangible → Waiting Time Tolerance → Patient Satisfaction	0.507	0.612	Rejected
H5b	Assurance → Waiting Time Tolerance → Patient Satisfaction	1.727	0.084	Rejected

	Hypothesis	T-statistic	p-value	
H5c	Reliability → Waiting Time Tolerance → Patient Satisfaction	0.690	0.490	Rejected
H5d	Patient Safety → Waiting Time Tolerance → Patient Satisfaction	0.774	0.439	Rejected
H5e	Empathy → Waiting Time Tolerance → Patient Satisfaction	1.094	0.274	Rejected
H5f	Responsiveness → Waiting Time Tolerance → Patient Satisfaction	1.509	0.131	Rejected
H6a	**Patient Trust x Tangible → Patient Satisfaction**	**2.611**	**0.009**	**Accepted**
H6b	Patient Trust x Assurance → Patient Satisfaction	0.925	0.355	Rejected
H6c	Patient Trust x Reliability → Patient Satisfaction	0.887	0.375	Rejected
H6d	Patient Trust x Patient Safety → Patient Satisfaction	0.445	0.657	Rejected
H6e	Patient Trust x Empathy → Patient Satisfaction	0.677	0.498	Rejected
H6f	Patient Trust x Responsiveness → Patient Satisfaction	0.263	0.793	Rejected
H7	Customer Requirement → Patient Satisfaction	0.124	0.901	Rejected

Table 7. Path coefficient

	Hypothesis	Path Coefficient
H1b	Assurance → Patient Satisfaction	**0.324**
H1d	Patient Safety→ Patient Satisfaction	**0.191**
H2b	Assurance → Waiting Time Tolerance	**0.357**
H2f	Responsiveness → Waiting Time Tolerance	**0.282**
H3	Waiting Time Tolerance → Patient Satisfaction	**0.274**
H6a	Patient Trust x Tangible → Patient Satisfaction	**-0.329**

5. Discussion

This study found that, among the SERVQUAL dimensions, only assurance and patient safety had a significant positive relationship with patient satisfaction, whereas tangible, reliability, empathy, and responsiveness showed no significant effect. This indicates that higher levels of assurance and patient safety are associated with greater patient satisfaction. These findings are consistent with previous research, which also reported that tangible, reliability, empathy, and responsiveness do not significantly influence satisfaction (Mustajab & Amelia, 2023).

The results of this study indicate that, apart from assurance and patient safety, the other SERVQUAL dimensions are less critical and therefore did not significantly influence patient satisfaction, whether provided well or poorly. One possible reason is that the majority of respondents are national health insurance users, who tend to focus more on how medical staff manage their health conditions rather than on physical or administrative aspects. For these patients, the quality of medical care is more important than the facility's appearance or the efficiency of administrative services, which correspond to the tangible, reliability, responsiveness, and empathy dimensions.

Assurance, which is associated with the competency, knowledge, and attitude of medical personnel, is a critical dimension of service quality. Patients, as service consumers, prioritize aspects that emphasize outcomes and risk reduction, often involving life-or-death implications. Research by Kalaja et al. (2023) confirmed a significant positive relationship between assurance and patient satisfaction, a finding further supported by Dwijayanti et al. (2023), who concluded that assurance directly influences satisfaction.

Dwijayanti et al. (2023) also identified assurance as the most dominant SERVQUAL dimension, while Kitapci et al. (2014) found it to be one of the most influential factors affecting patient satisfaction. Agustina and Handayani (2023) noted that improving physical aspects does not necessarily increase satisfaction, suggesting that such changes should be implemented cautiously, with greater emphasis on interpersonal relationships with patients.

This study also found a positive relationship between patient safety and patient satisfaction, aligning with the findings of Botchwey et al. (2023), who showed that communication and adherence to safety protocols significantly influence patient satisfaction. Similarly, Ali et al. (2023) highlighted the growing importance of patient safety, particularly since the COVID-19 pandemic, as it reflects care that is both error-free and harm-free.

In this study, the SERVQUAL dimensions of assurance and responsiveness showed a significant positive relationship with waiting time tolerance, while the other dimensions did not. This finding supports Nie's (2000) theoretical explanation that customers are willing to wait longer when they understand the reasons for the delay. In terms of responsiveness, clear explanations and prompt responses play a key role in increasing customers' tolerance for waiting. Similarly, Anderson et al. (2007) found that patients are more accepting of longer waiting times as long as they perceive that the time spent with the doctor is adequate. Dimensions such as tangible, empathy, patient safety, and reliability did not influence waiting time tolerance in this study, likely because tolerance is more closely associated with psychological rather than physical aspects (Zhang et al., 2023).

Another finding of this study is that waiting time tolerance is positively associated with patient satisfaction. In other words, the greater a patient's tolerance for

waiting, the higher their satisfaction. This result aligns with Zhang et al. (2023), who found that subjective waiting time, including the duration patients are willing to tolerate, positively affects patient satisfaction. Patients generally anticipate a certain amount of waiting when planning to see healthcare providers, and this tolerance is influenced by psychological factors; for example, higher levels of anxiety may lead patients to wait longer in order to receive reassurance or have their concerns addressed (Chu et al., 2019).

The study results indicate that hypothesis H4, which examines the relationship between patient trust and patient satisfaction, was not supported. This finding aligns with the studies by Abutar and Wuisan (2024) and Sari et al. (2020), but contrasts with Zhou et al. (2024), who reported a positive relationship between patient trust and satisfaction. This suggests that increasing patient trust does not necessarily lead to higher satisfaction, as trust typically develops over time and represents a long-term investment (Hussain et al., 2023). Given that trust builds gradually through repeated interactions, and most participants in this study had visited the clinic more than twice, it can be inferred that trust was already established. However, established trust does not automatically ensure satisfaction at a specific moment. Therefore, it can be concluded that while patients may already trust the healthcare service, their satisfaction is primarily determined by their actual experiences during the service encounter.

The relationship between SERVQUAL dimensions and patient satisfaction was not found to be mediated by waiting time tolerance; thus, hypotheses H5a, H5b, H5c, H5d, H5e, and H5f were rejected. This suggests that although assurance and responsiveness influence waiting time tolerance, which in turn affects patient satisfaction, the indirect effect is relatively small. Consequently, the direct impact of these dimensions on patient satisfaction is stronger than the indirect effect.

In this study, patient trust was found to negatively moderate the relationship between tangible and patient satisfaction. In other words, higher levels of trust weaken the influence of tangible factors on satisfaction. This is likely because patients perceive trust as a more important factor than tangibility. Descriptive analysis also showed that respondents had very high levels of trust in private primary healthcare facilities, reducing the impact of tangible factors on their satisfaction. Conversely, when trust is low, tangible aspects may play a more significant role in influencing patient satisfaction.

Customer requirements, as measured by the Kano Model and their direct effect on patient satisfaction, were found not to influence satisfaction significantly. This finding contrasts with Hartono (2018), who reported that one-dimensional and attractive Kano attributes affect customers' emotional (Kansei) satisfaction. The result reflects a core principle of the Kano Model, in which attributes are inherently asymmetric and non-linear—a notion further supported by previous research indicating that Kano attributes naturally exhibit these asymmetric and non-linear characteristics (Lin et al., 2017).

This study confirms that assurance continues to be the most consistent SERVQUAL dimension influencing patient satisfaction in healthcare services. It also suggests that the SERVQUAL model in the healthcare sector could be enhanced by incorporating the patient safety variable, which is not included in its traditional dimensions. Furthermore, the results indicate that the Kano model does not directly affect satisfaction, reflecting its inherently asymmetric and dynamic nature, which evolves in healthcare settings.

From a managerial perspective, private healthcare facilities should prioritize maintaining high standards of assurance and patient safety, as these are central to service quality and patient satisfaction. Facilities should also incorporate attractive attributes, such as 24-hour service, easy feedback channels, and follow-up care. Excessive investment in physical or tangible aspects should be avoided; instead, efforts should focus on enhancing patient trust, which has been shown to have a greater impact than tangible quality.

6. Conclusions

Based on the descriptive and analytical findings, this study highlights several key points. The Kano model identified three attractive attributes, ten one-dimensional attributes, and twelve must-be attributes. Private primary healthcare facilities (FKTP) should particularly focus on attractive features—such as 24-hour service availability, easy access to feedback, and post-treatment follow-up—as these elements can substantially enhance patient satisfaction when implemented.

Hypothesis testing revealed that assurance and waiting time tolerance had a significant impact on patient satisfaction, whereas tangible, reliability, empathy, responsiveness, patient trust, and customer requirements did not. The study also found that the additional dimension, patient safety, significantly influenced patient satisfaction, highlighting the importance of primary healthcare providers upholding a strong patient safety culture. Furthermore, assurance and responsiveness were found to affect waiting time tolerance; however, waiting time tolerance did not mediate the relationship between SERVQUAL dimensions and patient satisfaction.

The results further showed that patient trust negatively moderates the relationship between tangible and satisfaction, indicating that the influence of physical aspects diminishes when trust levels are high. Additionally, customer requirements were found to have no significant effect on satisfaction, reinforcing the idea that

the Kano model is inherently asymmetric, non-linear, and dynamic, with its impact evolving over time.

For future research, the model could be refined by exploring additional variables that influence waiting-time tolerance, using larger sample sizes across broader regions, and incorporating qualitative methods to gain deeper insights into patient expectations. Longitudinal studies of the Kano model are also recommended to track changes in service attributes over time.

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