

# Integrating Decision Support Systems with Service Quality: An IT-Driven Approach to Patient Satisfaction in Indonesian Inpatient Facilities

**Muchamad Zainul Rohman**

Universiti Utara Malaysia, Kedah, Malaysia | Politeknik Negeri Samarinda, Samarinda, Indonesia  
zainulmzr@polnes.ac.id (corresponding author)

**Nor Suzylah Sohaimi**

Universiti Utara Malaysia, Kedah, Malaysia  
suzsuhaimi@uum.edu.my

**Mohd Nazaruddin Yusoff**

Universiti Utara Malaysia, Kedah, Malaysia  
nazaruddin@uum.edu.my

*Received: 10 September 2025 | Revised: 14 October 2025 | Accepted: 24 October 2025*

*Licensed under a CC-BY 4.0 license | Copyright (c) by the authors | DOI: <https://doi.org/10.48084/etasr.14638>*

## ABSTRACT

Inpatient healthcare facilities are essential for delivering comprehensive treatment, yet maintaining patient satisfaction remains a significant challenge, especially in developing countries. Thus, it is crucial to explore the factors that influence this type of satisfaction. This study, conducted in Indonesia, identifies these key determinants. Utilizing data from 229 patients, the current research employs Smart PLS to analyze the relationships within the proposed model. The findings indicate that reliability, assurance, and patient cognition are the primary drivers of patient satisfaction in inpatient facilities. Additionally, the study confirms the mediating role of Decision Support System (DSS) use in three of the seven proposed hypotheses. Moreover, patient perceived value and service value significantly moderated the relationship between DSS use and patient satisfaction. These insights enhance the understanding of factors shaping patient experiences, equipping healthcare providers with strategies to improve service quality. By offering empirical evidence in the context of a developing country, this study contributes to the limited body of research on patient satisfaction and underscores the importance of integrating technological support and service quality improvements in healthcare facilities.

*Keywords-*decision support systems; digital health technologies; inpatient healthcare facilities; patient satisfaction; service value

## I. INTRODUCTION

Patient-centered care has become a priority, with patient satisfaction being a primary indicator of healthcare quality and effectiveness. It reflects how well healthcare services meet patient expectations and is linked to improved health outcomes, trust, and overall care experiences [1]. Conversely, dissatisfaction arises when expectations are unmet, underscoring the importance of aligning healthcare delivery with patient needs to enhance the quality and perception of inpatient services. Hospital inpatient care plays a vital role in treatment and rehabilitation, serving as a main indicator of the healthcare system performance [2]. Despite Indonesia meeting the WHO standards for hospital beds [3], rapid urban growth,

such as in Samarinda, highlights the need for a continuous evaluation of the inpatient facilities. Patient satisfaction, as a core measure of healthcare effectiveness, is, therefore, crucial for ensuring safe, efficient, and patient-centered care while guiding future improvements [4].

Inpatient healthcare facilities face challenges from rising costs, integration of modern patient-centered systems and technologies, limited insurance financing, and increasing demand, with patient satisfaction emerging as the most critical concern [5]. In many developing countries, including Indonesia, patient satisfaction levels remain low, affecting the trust, retention, and service quality of such facilities [6]. As a key indicator of healthcare performance, improving patient

satisfaction is essential for strengthening inpatient care and fostering competitive, patient-centered systems [7].

Research on inpatient facilities has highlighted several factors, including service quality, affordability, and the role of technologies such as DSS in improving patient satisfaction [8, 9]. While these factors are well studied in developed countries, research in developing countries, such as Indonesia, remains limited. In particular, the combined effects of service quality, cost affordability, and patient cognition on patient satisfaction are underexplored, with unique cultural and regional challenges in urban areas, such as Samarinda, requiring further investigation.

In Samarinda, rapid urbanization and population growth have increased the demand for improved inpatient services, yet issues such as responsiveness and resource allocation continue to limit patient satisfaction [10]. Despite adequate hospital capacity, patient experiences often fall short, and research on satisfaction with inpatient healthcare facilities in this context remains limited. Given its critical role in trust, repeat visits, and healthcare utilization, this study examines inpatient facility service quality, cost affordability, patient cognition, and the role of DSSs, along with patient perceived value and service value, to better understand their impact on patient satisfaction in Samarinda.

In the domain of healthcare service quality and patient satisfaction, numerous theoretical models have been applied to explain variations in patient perceptions and behavioral responses. Prominent among these are SERVQUAL, the Cognitive Evaluation Theory (CET), and the Technology Acceptance Model (TAM), which explain variations in the perceived service quality and satisfaction outcomes. The SERVQUAL framework has been widely recognized for its multidimensional assessment of tangibility, reliability, responsiveness, assurance, and empathy [11]; however, it has been criticized for its limited ability to capture technological and decision-making dimensions in modern healthcare contexts [12]. Similarly, models like TAM and CET have contributed valuable insights into technology acceptance and expectation alignment, but often neglect the service interaction and quality perception aspects central to patient experiences [13, 14]. While these models have individually advanced understanding in their respective domains, their isolated application fails to explain how service quality and digital decision-making tools jointly shape patient satisfaction. This limitation highlights the need for a more integrated approach that combines the experiential depth of SERVQUAL with the operational and analytical strength of DSSs.

Studies in hospital contexts [15, 16] confirm the effectiveness of SERVQUAL in identifying service delivery gaps and capturing patient perceptions. However, it has been criticized for overlooking intrinsic psychological factors, such as motivation, emotional reassurance, and cognitive evaluation, which also shape patient satisfaction [17]. Likewise, CET has been used to explain how patient autonomy and emotional engagement enhance trust and satisfaction [18], yet its application remains limited to motivational aspects without integrating structural service quality dimensions. Moreover, despite the extensive use of SERVQUAL and CET, their

combined application remains unexplored in the context of Indonesian inpatient healthcare, where institutional, cultural, and infrastructural challenges shape patient experiences differently from those in developed settings. Existing studies tend to address either the extrinsic (service quality) or intrinsic (cognitive and emotional) dimensions of satisfaction independently [19], without examining how technology-enabled systems can bridge these domains.

Moreover, few studies have attempted to combine psychological motivations with service quality frameworks [20], and none of them have systematically incorporated DSS as a linking mechanism. This theoretical gap limits the understanding of how digital systems can improve both service efficiency and psychological well-being. To address this issue, the current study integrates SERVQUAL and CET to unify service performance attributes with cognitive and motivational factors, offering a more comprehensive perspective on patient satisfaction. Within the Indonesian inpatient healthcare context where accessibility, emotional assurance, and information transparency remain key concerns. This integration introduces a novel IT-driven framework connecting DSS with patient cognition and perceived value. The approach not only strengthens SERVQUAL's explanatory power but also extends CET's applicability to institutional service evaluation, offering an innovative pathway for improving patient-centered care through technology-enabled decision-making. This integration represents a novel theoretical and practical contribution, linking motivational psychology with service quality assessment through an IT-driven perspective. It advances theoretical understanding by extending both models into a new empirical context, i.e., Indonesian inpatient healthcare, and contributes practically by providing a comprehensive analytical framework for enhancing patient satisfaction through service excellence, technological innovation, and psychological engagement.

Therefore, this study aims to explore the complex interrelationships among service quality, cost affordability, patient cognition, and patient satisfaction within inpatient facilities in Samarinda, Indonesia. By addressing these factors, the research provides an understanding of how they collectively influence patient satisfaction, particularly in developing country contexts where such studies are scarce. A key contribution of this study is its investigation of the mediating role of DSSs use and the moderating effects of patient-perceived value and service value, offering a view of patient satisfaction dynamics. Unlike prior research that has largely focused on general service practices [21], this study provides localized insights into the specific challenges faced by inpatient facilities in Samarinda, addressing regional disparities and healthcare delivery gaps. Ultimately, this research contributes a strategic framework for enhancing service quality and patient satisfaction in inpatient facilities, offering valuable guidance for policymakers and healthcare administrators in Indonesia.

Given the limited evidence from developing country contexts such as Indonesia, the literature review outlines existing findings and identifies key variables that inform the framework of this study.

### A. Inpatient Facility Service Quality

Service quality, which includes the perception of service delivery and interactions during care, significantly impacts patients' emotional health and satisfaction [22]. The SERVQUAL model, proven effective in measuring the customer perception of process quality, evaluates service quality using five dimensions: tangibility, reliability, responsiveness, assurance, and empathy. Tangibility encompasses physical facilities, equipment, and the environment, which influence patient comfort and satisfaction. Reliability involves accurate diagnoses and consistent care, while responsiveness ensures timely service delivery and protects patients' rights to care. Assurance provides patients with security and confidence in the services, while empathy focuses on respect, care, and attentive listening to patients' concerns, enhancing their positive perceptions. Effective interactions and communication between providers and patients also play a crucial role in building trust and optimizing patient experiences, ultimately improving satisfaction [23]. Therefore, service quality dimensions are closely linked to patient satisfaction in inpatient facilities. Thus, this study assumes the following:

- Hypothesis 1a: Reliability has a positive influence on patient satisfaction.
- Hypothesis 1b: Tangibility has a positive influence on patient satisfaction.
- Hypothesis 1c: Empathy has a positive influence on patient satisfaction.
- Hypothesis 1d: Responsiveness has a positive influence on patient satisfaction.
- Hypothesis 1e: Assurance has a positive influence on patient satisfaction.

### B. Cost Affordability

Patients' perceptions of cost affordability influence decision-making and satisfaction [24]. This can be viewed in terms of objective costs (actual price) and perceived costs (encoded price), with perceived expenses reflecting patients' evaluation of the fairness or rationality of costs [25]. High medical costs can lead to financial distress, reduced care-seeking behavior, and dissatisfaction, while reasonable pricing and higher reimbursement ratios positively affect patient satisfaction by reducing the financial burden [26]. Patients often use these costs as a reference to evaluate their overall healthcare experience, which influences their attitudes and satisfaction [27]. Previous research highlights the impact of perceived expenses on satisfaction, as patients tend to report higher satisfaction when they perceive costs as fair and reasonable [28]. This study examines the role of cost affordability within the context of inpatient facilities in Samarinda, emphasizing its impact on patient satisfaction. Hence, this study posits the following:

- Hypothesis 2: Cost affordability has a positive influence on patient satisfaction.

### C. Patient Cognition

Patient cognition refers to patients' understanding and awareness of inpatient facilities' services, which play a critical role in the successful delivery of medical services and health outcomes [29]. It has been shown that improving patient cognition, such as by closing the gap between patients' understanding and actual medical activities, positively impacts patient satisfaction [30]. In the inpatient facilities' setting, guiding patients to access and comprehend relevant health information enhances trust, compliance, and health management, thereby improving doctor-patient communication and patient experience [31]. Moreover, cognitive behavioral research shows that improved patient cognition can lead to better outcomes and higher satisfaction by reducing the negative perceptions [32]. Greater patient understanding of medical services fosters stronger doctor-patient relationships, better communication, and higher perceived service quality, ultimately enhancing patient satisfaction. Hence, patient cognition is a significant predictor of satisfaction within inpatient facilities. Therefore, the study posits that:

- Hypothesis 3: Patient cognition has a positive influence on patient satisfaction.

### D. DSS Use

The use of DSSs in healthcare has shown a significant impact on patient satisfaction by improving decision performance and service quality [33]. It directly supports users, such as healthcare providers, in achieving the goal of making better, more informed decisions, which can enhance overall patient care outcomes [34]. Users are more likely to adopt a DSS when they perceive it as a tool that improves their decision-making performance [35]. The intrinsic motivation to use DSS stems from the belief that it aids in achieving accurate and efficient decision-making, particularly when leveraging compensatory decision strategies embedded in the system [36].

In healthcare, DSS facilitates clinical decision-making by providing evidence-based recommendations, reducing errors, and improving diagnostic accuracy, which leads to better patient outcomes and satisfaction [37]. It has been demonstrated that integrating DSS into clinical workflows enhances provider performance and communication with patients, thereby positively influencing patient perceptions of care quality and satisfaction [38]. Furthermore, the successful implementation of DSS aligns with patients' growing expectations for transparency and precision in healthcare, fostering trust and compliance [39]. Thus, the use of DSSs can serve as a mediator in the relationship between service quality, cost affordability, patient cognition, and patient satisfaction. Thus, it is proposed that:

- Hypothesis 4: The use of DSS has a positive influence on patient satisfaction.
- Hypothesis 5a: The use of DSS mediates the relationship between reliability and patient satisfaction.
- Hypothesis 5b: The use of DSS mediates the relationship between tangibility and patient satisfaction.

- Hypothesis 5c: The use of DSS mediates the relationship between empathy and patient satisfaction.
- Hypothesis 5d: The use of DSS mediates the relationship between responsiveness and patient satisfaction.
- Hypothesis 5e: The use of DSS mediates the relationship between assurance and patient satisfaction.
- Hypothesis 5f: The use of DSS mediates the relationship between cost affordability and patient satisfaction.
- Hypothesis 5g: The use of DSS mediates the relationship between patient cognition and patient satisfaction.

#### E. Patient Perceived Value

Patient perceived value is a critical factor influencing patient satisfaction in healthcare. Perceived value is determined by the balance between the perceived benefits (e.g., service quality) and perceived sacrifices (e.g., costs) [40]. It has been shown that a higher perceived value leads to increased patient satisfaction and loyalty [41]. In various contexts, including healthcare services, health insurance, and medical tourism, empirical evidence highlights the direct and indirect impact of the perceived value on satisfaction [42]. Perceived value acts as a cognition-based construct, capturing the trade-off between benefits and sacrifices, which can trigger affective responses, ultimately influencing satisfaction [43]. Hence, this relationship underscores the importance of enhancing perceived value to improve patient satisfaction in healthcare settings.

The relationship between two variables can sometimes be influenced by a third variable, which moderates the strength or direction of their interaction. Moderation analysis provides insights into the effect of this external variable on the model [44]. Using perceived patient value as a moderator in the relationship between DSS use and patient satisfaction is justified both theoretically and practically. Theoretically, it aligns with frameworks, such as the TAM [14] and service quality models, highlighting how the patients' perception of the benefits relative to costs (time, effort, or money) influences their satisfaction. Perceived value explains how DSS functionalities, such as enhanced decision-making and efficiency, translate into satisfaction when patients recognize these benefits [45]. In addition, it accounts for variability in satisfaction by addressing how patients' expectations and perceptions mediate their responses to DSS use. Therefore, it is assumed that:

- Hypothesis 6: There is a significant moderation influence of patient perceived value on the relationship between DSS use and patient satisfaction.

#### F. Service Value

In healthcare, service value is a critical factor influencing patient satisfaction. Service value is defined as the patient's assessment of the benefits received relative to the costs incurred [46], and it plays an important role in influencing patient satisfaction. Satisfaction reflects patients' emotional and cognitive responses to their healthcare experiences, making perceived value a crucial determinant of their overall service evaluation [47]. In healthcare, value encompasses various

dimensions, such as quality of care, efficiency, accessibility, and the emotional and relational aspects of provider-patient interactions. For instance, patients who perceive high value in terms of efficient service delivery, clear communication, and empathetic care are more likely to report higher satisfaction levels. Conversely, perceived low value, such as long waiting times or unclear communication, can negatively impact satisfaction [48].

The perceived value significantly impacts satisfaction in service industries, including healthcare [49]. Hence, service value can moderate the relationship between DSS use and patient satisfaction by influencing how patients interpret the benefits of DSS, such as improved decision-making and care quality, relative to the effort, time, or financial costs associated with its use. Furthermore, healthcare industries are inherently patient-centered, and perceptions of service value vary widely among individuals based on their experiences, expectations, and personal circumstances [50]. For instance, patients perceiving high value in DSS-enabled services, such as faster diagnoses, better communication, or reduced errors, are likely to report higher satisfaction. Conversely, those perceiving low value due to costs, like time delays or perceived complexities, may exhibit diminished satisfaction, regardless of DSS effectiveness [51]. Therefore, it is assumed that:

- Hypothesis 7: There is a significant moderation influence of service value on the relationship between DSS use and patient satisfaction.

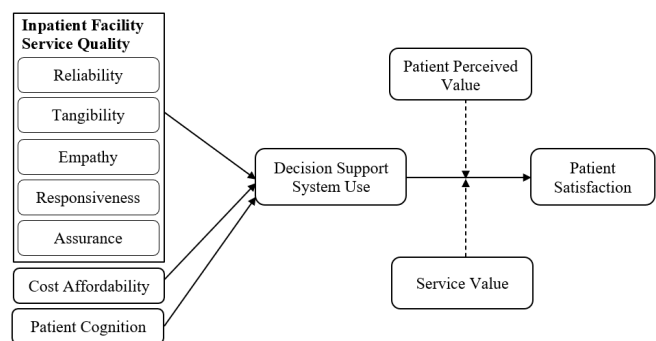


Fig. 1. Research framework.

## II. METHODOLOGY

This study utilized a quantitative approach to investigate the factors affecting patient satisfaction with inpatient facilities in Samarinda, Indonesia.

#### A. Measurement and Data Collection

The data were collected through a closed questionnaire. Section A of the questionnaire focuses on the independent variables, including inpatient facility service quality dimensions (reliability, tangibility, empathy, responsiveness, assurance), cost affordability, and patient cognition. Section B covers the mediator, moderators, and dependent variables, specifically DSS use, patient perceived value, service value, and patient satisfaction. All constructs were measured using a 7-point Likert scale ranging from strongly disagree (1) to strongly agree (7), with items adapted from established studies.

The inpatient facility service quality dimension scale was adapted from [52], cost affordability from [53], and patient cognition from [54]. DSS use was assessed using according to [55], patient perceived value based on [56], and service value on [57]. Patient satisfaction was measured using a scale provided in [58]. Additionally, Section C includes questions about the demographic profiles of patients in Samarinda.

Furthermore, the study utilized an online survey. Ethical considerations were prioritized, with the research topic and purpose explained to respondents beforehand. It was emphasized that all information collected would be used exclusively for academic purposes. Moreover, the study employed purposive sampling to identify patients in inpatient facilities in Samarinda city. This non-random sampling method selects participants based on specific characteristics or criteria relevant to the research, ensuring data relevance and focusing on individuals with relevant knowledge or experience [59].

Besides, the study aimed to understand the factors influencing patient satisfaction in inpatient facilities in Samarinda by distributing a survey link to patients using these

services. The survey was open for responses throughout January 2025, yielding 229 valid responses out of 241. This sample size is deemed sufficient for Partial Least Squares Structural Equation Modeling (PLS-SEM), as it adheres to the "10 times rule," requiring at least 10 times the largest number of paths pointing to a latent variable [60]. PLS-SEM is particularly effective for smaller samples, handling complex models and ensuring statistically significant relationships, model stability, and convergence [61].

SPSS (Version 27) was used for descriptive statistical analyses. The demographic breakdown for the final sample of 229 respondents, presented in Table I, was composed of 78.60% males and 21.40% females. Most participants were 20-30 years old, representing 98.25% of the sample. A significant portion, 58.95%, held a Bachelor's degree, while 51.52% reported feeling comfortable with their financial status. Additionally, 56.33% resided in urban areas, and 84.72% reported having a normal health condition. Moreover, 53.27% of the participants had utilized healthcare services within the past year.

TABLE I. DEMOGRAPHIC CHARACTERISTICS OF THE RESPONDENTS

Demographic variables	Category	Frequency	Percent (%)
Gender	Male	180	78.60
	Female	49	21.40
Age	20-30 years	225	98.25
	41-50 years	4	1.75
Educational level	High school	81	35.37
	Bachelor's degree	135	58.95
	Master's degree or higher	13	5.68
Income level	Less than Rp 5.000.000	205	89.52
	Rp 5.000.000 - Rp 6.000.000	14	6.11
	Rp 7000.000 - Rp 8.000.000	2	0.87
	More than Rp 8.000.000	8	3.50
Self-perceived financial status	Comfortable	118	51.52
	Tight	96	41.92
	Very tight or poor	15	6.56
Residency	Urban	129	56.33
	Rural	96	41.92
	Remote	4	1.75
Health characteristics	Very good or excellent	34	14.85
	Normal	194	84.72
	Chronic physical condition	1	0.43
Utilization of healthcare	Used healthcare services in the last year	122	53.27
	Used healthcare services in the last 6 months	57	24.89
	Used healthcare services in the Last 3 months	50	21.84

This demographic pattern reflects the growing representation of younger, educated, and digitally literate populations actively engaging with healthcare systems in Indonesian urban centers. The dominance of respondents aged 20–30 aligns with national demographic trends showing higher healthcare awareness and digital engagement among younger adults [62]. Their strong educational background suggests a greater capacity to assess service quality and interact with technology-driven healthcare systems, consistent with the findings in [63], where it was noted that educated patients tend to have higher service expectations and satisfaction sensitivity. The relatively high share of financially comfortable respondents also implies that economic stability enhances healthcare access and satisfaction, a relationship emphasized in

[64]. The urban predominance further indicates that inpatient facilities in metropolitan areas remain more accessible and technologically integrated than their rural counterparts. Overall, this demographic profile highlights a patient base that is young, educated, urban-oriented, and well-positioned to provide informed insights into the integration of DSSs and service quality dimensions in healthcare settings.

#### B. Statistical Technique

This study employed PLS-SEM using Smart PLS 4 to test hypotheses, leveraging its variance-based approach for analyzing complex datasets, multicollinearity, and small sample sizes without distributional assumptions [65]. The model examined direct relationships, with DSS use as a

mediator and patient perceived value and service value as moderators, aligning with prior research on mediating and moderating effect analyses in Smart PLS [66]. The effectiveness of PLS-SEM in complex moderating effects has been emphasized, making it a preferred tool in social science research due to its higher statistical power and suitability for predictive research objectives [67].

### III. DATA ANALYSIS AND RESULTS

The analytical procedure using Smart PLS 4 was executed in two sequential stages, encompassing the evaluation of the measurement model and the subsequent assessment of the structural model. To establish the robustness of the measurement instruments, both item reliability and construct reliability were systematically assessed. For item reliability, each item was required to have a loading of at least 0.5 on its corresponding latent construct [68]. The model met this criterion, with all items exceeding the threshold, as presented in Table II.

To evaluate construct reliability, the study considered Cronbach's Alpha (CA) and Composite Reliability (CR). The CA values were well above the proposed threshold of 0.50, while the CR values fell between 0.882 and 0.956, exceeding the proposed minimum of 0.70 [69]. These findings demonstrate strong internal consistency among the constructs.

The study further assessed both convergent and discriminant validity. Convergent validity was evaluated through the Average Variance Extracted (AVE), which ranged from 0.647 to 0.867, exceeding the minimum threshold of 0.50 [70]. Discriminant validity was confirmed by comparing the square root of AVE with cross-correlations, ensuring that constructs were not highly correlated with each other, as presented in Table III. These findings confirm that the model exhibits strong reliability and validity.

After fulfilling the requirements of the measurement phase, the model fit indices and the proposed relationships in the structural model phase were evaluated. However, before proceeding, multicollinearity and CMB issues should be first scrutinized, as their presence is not proposed in any study. The most commonly used method for examining multicollinearity issues in PLS-SEM is the Variance Inflation Factor (VIF). Typically, the VIF values should not surpass 5. The highest VIF value was 4.635 (<5), suggesting that multicollinearity is not a concern in this study. Besides, CMB can be evaluated through the Harman single-factor test. The measurement method used may potentially lead to CMB. However, a model is considered unaffected by CMB if the variance remains under 50% [71]. In this study, the variance was found to be 48.61%, indicating that CMB is not a concern.

The  $R^2$  value is used to assess the quality of each variable in a structural model. An  $R^2$  value within the range of 0 to 1 is considered acceptable [72]. In this study, the  $R^2$  values for DSS use were 65% and patient satisfaction was 48.8%, indicating a substantial level of explanatory power, as shown in Table IV.

TABLE II. RELIABILITY ANALYSIS

Variables	Items	Loadings	CA	CR	AVE
Reliability	R1	0.827	0.899	0.925	0.712
	R2	0.891			
	R3	0.840			
	R4	0.847			
	R5	0.814			
Tangibility	T1	0.817	0.860	0.905	0.705
	T2	0.811			
	T3	0.875			
	T4	0.854			
Empathy	E1	0.905	0.875	0.914	0.726
	E2	0.843			
	E3	0.800			
	E4	0.857			
Responsiveness	RS1	0.880	0.800	0.882	0.715
	RS2	0.886			
	RS3	0.765			
Assurance	A1	0.851	0.909	0.936	0.786
	A2	0.910			
	A3	0.900			
	A4	0.884			
Cost affordability	C1	0.822	0.879	0.886	0.663
	C2	0.731			
	C3	0.767			
	C4	0.923			
Patient cognition	PC1	0.748	0.862	0.901	0.647
	PC2	0.691			
	PC3	0.876			
	PC4	0.840			
	PC5	0.852			
DSS use	DSS1	0.924	0.923	0.951	0.867
	DSS2	0.923			
	DSS3	0.947			
Patient perceived value	PV1	0.839	0.926	0.944	0.771
	PV2	0.886			
	PV3	0.885			
	PV4	0.873			
	PV5	0.905			
Service value	SV1	0.924	0.939	0.956	0.846
	SV2	0.919			
	SV3	0.923			
	SV4	0.911			
Patient satisfaction	PS1	0.873	0.937	0.955	0.841
	PS2	0.924			
	PS3	0.936			
	PS4	0.935			

Additionally,  $Q^2$  was determined using the blindfolding procedure, with a proposed threshold of greater than zero. The  $Q^2$  values exceeded zero, confirming that the model exhibits good predictive relevance. The study also examined communality and redundancy as additional measures of structural model quality. A structural model is considered better if communality is greater than 0.4 and redundancy is less than 0.10 [73]. The results outlined in Table IV show that all constructs meet the communality verification requirements. While the redundancy values for DSS use and patient satisfaction exceed 0.10, the model remains acceptable when considering  $R^2$  and communality values. Thus, all constructs satisfy the structural model verification criteria, confirming that the model is appropriate for testing hypotheses based on the metrics presented in Table V. The results of hypothesis testing are also illustrated in Table V, providing insights into the relationships among the study variables.

TABLE III. VALIDITY ANALYSIS

Variables	A	C	DSS	E	PC	PS	PV	R	RS	SV	T
A	<b>0.887</b>										
C	0.067	<b>0.814</b>									
DSS	0.739	0.093	<b>0.931</b>								
E	0.838	0.093	0.694	<b>0.852</b>							
PC	0.611	0.048	0.662	0.645	<b>0.804</b>						
PS	0.622	0.108	0.681	0.620	0.795	<b>0.917</b>					
PV	0.753	0.057	0.864	0.719	0.585	0.598	<b>0.878</b>				
R	0.798	0.071	0.714	0.836	0.560	0.597	0.694	<b>0.844</b>			
RS	0.821	0.004	0.697	0.833	0.641	0.618	0.664	0.767	<b>0.845</b>		
SV	0.707	-0.021	0.840	0.677	0.585	0.535	0.881	0.631	0.665	<b>0.920</b>	
T	0.778	0.066	0.656	0.791	0.624	0.639	0.629	0.773	0.763	0.560	<b>0.839</b>

TABLE IV. STRUCTURAL MODEL SPECIFICATION

Constructs	R <sup>2</sup>	Communality	Redundancy (Q <sup>2</sup> )
R	Predictor	0.560	-
T	Predictor	0.495	-
E	Predictor	0.533	-
RS	Predictor	0.423	-
A	Predictor	0.625	-
C	Predictor	0.410	-
PC	Predictor	0.473	-
PV	Predictor	0.646	-
SV	Predictor	0.716	-
DSS	0.650	0.681	0.549
PS	0.488	0.710	0.395

TABLE V. PLS BOOTSTRAPPING RESULTS

Hypothesis	Standard Beta	Standard Deviation	T-values	p-values	Decision
H1a R → PS	0.243	0.075	3.246	p < 0.01 (0.001)	Accept
H1b T → PS	-0.020	0.078	0.260	p > 0.05 (0.795)	Reject
H1c E → PS	-0.078	0.088	0.891	p > 0.05 (0.373)	Reject
H1d RS → PS	0.084	0.075	1.116	p > 0.05 (0.264)	Reject
H1e A → PS	0.259	0.092	2.801	p < 0.01 (0.005)	Accept
H2 C → PS	0.037	0.049	0.752	p > 0.05 (0.452)	Reject
H3 PC → PS	0.243	0.076	3.209	p < 0.01 (0.001)	Accept
H4 DSS → PS	0.801	0.109	7.371	p < 0.001 (0.000)	Accept
H5a R → DSS → PS	0.243	0.075	3.246	p < 0.01 (0.001)	Accept
H5b T → DSS → PS	-0.020	0.078	0.260	p > 0.05 (0.795)	Reject
H5c E → DSS → PS	-0.078	0.088	0.891	p > 0.05 (0.373)	Reject
H5d RS → DSS → PS	0.084	0.075	1.116	p > 0.05 (0.264)	Reject
H5e A → DSS → PS	0.259	0.092	2.801	p < 0.01 (0.005)	Accept
H5f C → DSS → PS	0.037	0.049	0.752	p > 0.05 (0.452)	Reject
H5g PC → DSS → PS	0.243	0.076	3.209	p < 0.01 (0.001)	Accept
H6 PV x DSS → PS	0.202	0.098	2.068	p < 0.05 (0.039)	Accept
H7 SV x DSS → PS	-0.230	0.097	2.368	p < 0.05 (0.018)	Accept

#### IV. DISCUSSION AND CONCLUSION

This research investigates the determinants of patient satisfaction in inpatient facilities in Samarinda. Adopting a comprehensive perspective, it incorporates multiple dimensions, such as service quality, cost affordability, patient cognition, and the use of Decision Support Systems (DSSs) to evaluate their collective effect on patient satisfaction. The model accounts for 48.8% of the variance in patient satisfaction, indicating a moderate level of explanatory power and providing deeper insights than earlier research that analyzed these factors separately. To accomplish this, the study proposed seventeen hypotheses, of which nine were confirmed, while eight were not supported.

The hypotheses were divided into three categories, with the first addressing the direct influences on patient satisfaction. The empirical findings revealed that reliability, assurance, patient cognition, and DSS use have a positive influence on patient satisfaction.

The study provides strong evidence that reliability significantly enhances patient satisfaction, aligning with prior research in healthcare services [74]. This suggests that improving reliability in inpatient facilities in Samarinda can lead to long-term patient satisfaction. Similarly, assurance was found to positively impact patient satisfaction, supporting previous literature [75]. This underscores the importance of assurance in inpatient facilities in influencing patient perceptions and experiences.

Additionally, patient cognition was found to positively affect patient satisfaction, a result consistent with former studies [76]. This implies that enhancing patient awareness and understanding of inpatient facilities can lead to higher satisfaction levels. Furthermore, the study confirmed that DSS use positively influences patient satisfaction, aligning with earlier findings [77]. This stresses the critical role of DSS in improving patient decision-making and overall satisfaction.

The use of DSSs is the key driver of patient satisfaction, representing the most impactful factor in the model. While the reliability of inpatient facilities and affordability of costs also contribute to satisfaction, their effects are less significant compared to the role of DSS use.

Furthermore, tangibility, empathy, responsiveness, and cost affordability did not positively impact patient satisfaction, and their association with the latter is not statistically significant. These results are contradictory to previous research, which suggested that tangibility, empathy, and responsiveness positively impact patient satisfaction [78]. Moreover, cost affordability also showed an insignificant relationship with patient satisfaction. The result contradicts evidence reported in earlier studies [79].

The insignificant relationship between tangibility, empathy, responsiveness, and cost affordability with patient satisfaction can be attributed to several contextual and methodological factors. One primary reason is context-specific differences. Previous studies, such as [80], identified a positive association between these variables and patient satisfaction across various healthcare contexts. However, in the inpatient facilities of Samarinda, patients may prioritize other aspects like reliability and assurance over physical attributes or interpersonal service dimensions.

Additionally, evolving patient expectations could explain these findings. As healthcare services advance, patients may focus more on treatment outcomes, decision-making support, and efficiency, rather than physical infrastructure (tangibility) or emotional aspects like empathy and responsiveness. In some settings, patients may perceive medical competence and technological support as more critical factors influencing their overall satisfaction.

Cultural and socioeconomic factors also play a role. In certain populations, cost affordability may not strongly impact patient satisfaction if healthcare expenses are viewed as an unavoidable necessity rather than a determinant of service quality [81]. Moreover, patients may not weigh responsiveness and empathy as heavily when evaluating healthcare services, especially if they expect efficiency and reliability over personalized care.

The second group examined the mediating role of DSS use in the identified relationships. Out of the seven proposed hypotheses, three were supported by the results. The analysis showed that DSS use significantly mediates three specific relationships: between reliability and patient satisfaction, between patient cognition and patient satisfaction, and between assurance and patient satisfaction. These findings stress the important role of DSS use in influencing patient satisfaction, especially within these contexts. DSS enhances reliability by

ensuring accurate, consistent, and timely medical decisions, thereby building patient trust. It also strengthens patient cognition by improving information accessibility and comprehension, helping patients make informed healthcare decisions. Additionally, DSS reinforces assurance by supporting healthcare professionals in delivering precise, transparent, and evidence-based recommendations, instilling confidence in patients. Moreover, compared to previous studies in Samarinda that only focused on various methods to select inpatient facility locations [82, 83], this research highlights a paradigm shift toward technology-driven, reliability-focused inpatient facility selection.

Besides, these findings suggest that DSS is more than just a technological tool; it is a key driver of patient-centered care. By facilitating efficient decision-making, reducing errors, and improving communication, DSS amplifies the positive effects of reliability, cognition, and assurance on patient satisfaction. Given its significant mediation effects, healthcare facilities should prioritize DSS integration to enhance service quality and overall patient experience.

However, DSS use did not mediate the relationship between tangibility, empathy, responsiveness, cost affordability, and patient satisfaction. The underlying cause of the non-significant results can be attributed to the nature of these factors. DSS primarily enhances cognitive and process-driven aspects of healthcare, such as reliability and assurance, rather than experiential or financial elements. Tangibility, being related to physical infrastructure, is not influenced by DSS, which focuses on decision-making rather than facility improvements. Similarly, empathy and responsiveness are human-driven qualities that rely on interpersonal interactions, making DSS less relevant in shaping patient perceptions of these aspects.

Additionally, cost affordability is an external economic factor that DSS does not control, limiting its ability to mediate its impact on patient satisfaction. These findings suggest that while DSS plays a crucial role in improving decision-making and operational efficiency, human-centered care, service responsiveness, and cost management strategies are equally vital in enhancing patient satisfaction. A balanced approach integrating technology with personalized care is necessary to ensure comprehensive improvements in healthcare service quality.

The third group focused on how patients perceived value and service value moderate the relationship between DSS use and patient satisfaction. Both of the proposed hypotheses in this group were validated by the results. The interaction between patient perceived value and DSS use has a positive and significant effect on patient satisfaction. This indicates that the use of DSS enhances the influence of patients' perceived value on their satisfaction. DSS may improve decision-making, treatment planning, and communication, making perceived value more impactful in shaping patient satisfaction.

Furthermore, the interaction between service value and DSS use has a negative and significant effect on patient satisfaction. This indicates that DSS use weakens the relationship between service value and patient satisfaction. A possible explanation is that DSS may introduce complexities or

reduce personal interactions in service delivery, making patients perceive service value as less influential in determining their overall satisfaction. This result highlights the need for a balanced approach, where DSS complements rather than overrides the human aspect of service delivery.

To conclude, this study highlights key factors influencing patient satisfaction in inpatient facilities of Samarinda, emphasizing the critical role of reliability, assurance, patient cognition, and DSS use. Among these, DSS use emerged as the most influential, reinforcing its impact on decision-making and patient experience. Meanwhile, tangibility, empathy, responsiveness, and cost affordability were found to have an insignificant effect, indicating that patients prioritize service reliability and technological support over physical attributes and interpersonal interactions. Furthermore, DSS use mediates the relationship between reliability, assurance, and patient cognition with satisfaction, while patient perceived value enhances DSS impact, and service value weakens it.

Based on demographic insights, recommendations include expanding digital health literacy programs for younger, educated patients, enhancing service reliability and assurance for financially stable individuals, and addressing gender-specific needs. Urban healthcare delivery should be optimized with smart hospital systems and AI-driven service personalization, while DSS should promote preventive healthcare strategies for patients in normal health conditions. Additionally, balancing DSS integration with human-centered interactions is crucial to maintaining patient trust and satisfaction. These targeted strategies will help inpatient facilities enhance overall healthcare outcomes and service quality.

#### A. Implications

This study contributes significantly to the theoretical understanding of patient satisfaction with inpatient facilities in Samarinda. It contributes to healthcare services literature by integrating the SERVQUAL model with Cognitive Evaluation Theory (CET), offering a more comprehensive framework for understanding service quality. Traditional healthcare service quality models, such as SERVQUAL, focus on tangible and external service attributes like reliability, responsiveness, and empathy. However, by incorporating CET, which emphasizes intrinsic motivation and psychological needs, autonomy, competence, and relatedness, the study broadens the perspective on service quality. It highlights that patient satisfaction is not only influenced by service delivery but also by how well healthcare experiences fulfil fundamental psychological needs.

This theoretical integration challenges conventional models by demonstrating that service quality is not merely a transactional experience but also a psychological one. Patients' perceptions of healthcare services are shaped by their sense of empowerment, involvement in decision-making, and emotional connection with providers. By emphasizing intrinsic motivation, the study shifts the focus from a provider-centric to a patient-centric approach, reinforcing the idea that healthcare services should foster both physical well-being and psychological engagement.

Furthermore, this integration has significant implications for healthcare policy and service design. It suggests that healthcare organizations should go beyond traditional service quality enhancements and consider how their policies impact patient motivation and autonomy. Patient-centered care models that encourage shared decision-making align with CET principles and can lead to improved patient satisfaction, treatment adherence, and overall well-being. Ultimately, this study advances theoretical extensions by linking service quality with motivation constructs, providing a richer understanding of patient experiences in healthcare settings.

To enhance patient satisfaction in Samarinda's inpatient facilities, hospitals should prioritize DSS integration, service reliability, and patient cognition while tailoring strategies. Given the young (20-30 years), predominantly male (78.6%) population with a high level of education (59% holding a Bachelor's degree), hospitals should implement mobile-based DSS, AI-driven health platforms, and interactive digital tools to improve decision-making and patient engagement.

Since 90% of patients have lower income levels and 42% perceive financial constraints, DSS should include transparent cost estimation tools, insurance integration, and flexible payment options to support financially tight patients. Additionally, with 56.33% living in urban areas and 41.92% in rural areas, DSS strategies should differentiate between high-tech urban smart hospital systems and remote-access telemedicine solutions for rural patients.

Given that most patients (84.72%) report normal health, DSS should emphasize preventive care, risk assessments, and self-monitoring tools. Patients visiting hospitals less frequently would benefit from teleconsultations, digital follow-ups, and automated medication reminders. Since tangibility, empathy, responsiveness, and cost affordability did not significantly impact satisfaction, hospitals should shift focus toward technology-driven and reliability-based improvements while maintaining a balance between DSS integration and human-centered care.

Finally, as service value was found to weaken DSS effectiveness, hospitals should ensure that DSS complements rather than replaces interpersonal interactions. AI-powered virtual assistants, emotionally intelligent DSS interactions, and hybrid patient engagement models should be adopted to maintain trust and satisfaction. These demographically tailored strategies will optimize healthcare service quality and long-term patient satisfaction in inpatient facilities of Samarinda.

#### B. Limitations and Future Research Directions

This study carries certain limitations. First, it was conducted in inpatient facilities in Samarinda, which limits the generalizability of the findings to other healthcare settings or regions with different infrastructures, cultural expectations, and economic conditions. Additionally, the reliance on survey data introduces the potential for self-reporting bias, as patients' responses may be influenced by social desirability or recall inaccuracies. Incorporating objective measures, such as real-time feedback or electronic health records, could provide a more accurate assessment of patient satisfaction. Furthermore, the study primarily focused on DSS use, service quality, cost

affordability, and patient cognition, overlooking other critical factors like hospital management practices, staff workload, and regulatory policies. Although patient perceived value and service value were examined as moderating factors, other potential influences, such as trust in technology, digital health literacy, and patient-provider communication, were not considered. Finally, the financial feasibility of DSS implementation was not explored, leaving questions about its cost-benefit impact and operational sustainability in different healthcare environments.

Future research should address these limitations by expanding the study to diverse healthcare facilities, including outpatient clinics, rural hospitals, and international healthcare systems, to improve generalizability. A mixed-method approach incorporating qualitative interviews, real-time patient feedback, and observational studies would help validate the findings and reduce the response bias. Additionally, future studies should examine a broader range of service quality factors, such as staffing levels, hospital policies, and organizational culture, to provide a more comprehensive view of the patient satisfaction determinants. Research should also consider the experiences of older populations, chronic disease patients, and individuals with lower education levels to capture variations in the perceptions of DSS effectiveness. Furthermore, exploring trust in technology and digital health literacy as moderating factors could provide insights into how different patient groups interact with DSS. Longitudinal studies tracking the long-term effects of DSS adoption on patient satisfaction would help determine whether reliance on technology strengthens or weakens trust over time. Finally, assessing the economic impact of DSS implementation through cost-benefit analyses and efficiency evaluations would aid policymakers and healthcare administrators in making informed investment decisions, ensuring that technology adoption aligns with both patient needs and financial sustainability.

#### REFERENCES

- [1] N. Alsubahi, W. Groot, A. A. Alzahrani, A. Ahmad, and M. Pavlova, "Patient-centered care and satisfaction of patients with diabetes: insights from a survey among patients at primary healthcare centers in Saudi Arabia," *BMC Primary Care*, vol. 26, no. 1, May 2025, Art. no. 140, <https://doi.org/10.1186/s12875-025-02778-1>.
- [2] A. Oster, E. Wiking, G. H. Nilsson, and C. B. Olsson, "Patients' expectations of primary health care from both patients' and physicians' perspectives: a questionnaire study with a qualitative approach," *BMC Primary Care*, vol. 25, no. 1, Apr. 2024, Art. no. 128, <https://doi.org/10.1186/s12875-024-02389-2>.
- [3] "Samarinda Municipality in Figures 2024," BPS-Statistics Samarinda Municipality, Samarinda, Indonesia, Technical Report 64720.24001, Feb. 2024.
- [4] M. R. Islam Chowdhury, T. Rahman Chowdhury, and S. B. Abdullah, "Strategies for Improving Patient Experience and Satisfaction in Healthcare Facilities in USA," *International Journal of Science and Healthcare Research*, vol. 9, no. 4, pp. 357–369, Dec. 2024, <https://doi.org/10.52403/ijshr.20240442>.
- [5] L. Li, X. Cui, and W. Feng, "Enhancing Patient Satisfaction in Cross-Regional Healthcare: a Cross-Sectional Study in the Knowledge-Based Healthcare Landscape," *Journal of the Knowledge Economy*, vol. 15, no. 3, pp. 14172–14198, Dec. 2023, <https://doi.org/10.1007/s13132-023-01685-z>.
- [6] A. Noviyani and P. Viwattanakulvanid, "Exploring Patients' Perspectives on Healthcare Service Quality in Outpatient Settings at a Public Hospital in Palembang, Indonesia: A Qualitative Study," *Belitung Nursing Journal*, vol. 10, no. 6, pp. 703–711, Nov. 2024, <https://doi.org/10.33546/bnj.3594>.
- [7] P. Mularczyk-Tomczewska, M. Gujski, J. M. Koperdowska, J. Wójcik, and A. Silczuk, "Factors Influencing Patient Satisfaction with Healthcare Services in Poland," *Medical Science Monitor*, vol. 31, May 2025, <https://doi.org/10.12659/MSM.948225>.
- [8] K. Al-Assaf, Z. Bahrour, and V. Ahmed, "Transforming Service Quality in Healthcare: A Comprehensive Review of Healthcare 4.0 and Its Impact on Healthcare Service Quality," *Informatics*, vol. 11, no. 4, Dec. 2024, Art. no. 96, <https://doi.org/10.3390/informatics11040096>.
- [9] R. Bhaladhare and P. Rishipathak, "Strategies of Quality Improvement in Healthcare Organizations on Sustainable Healthcare System," *Discover Social Science and Health*, vol. 5, no. 1, May 2025, Art. no. 74, <https://doi.org/10.1007/s44155-025-00226-0>.
- [10] M. Ardan and K. Febriyanto, "Optimising Hospital Management Through Integrated Epidemiological Data: A Study in Samarinda," *Jurnal Kedokteran Dan Kesehatan Indonesia*, vol. 16, no. 2, pp. 226–241, Aug. 2025.
- [11] A. Parasuraman, V. A. Zeithaml, and L. A. Berry, "SERVQUAL A Multiple-item Scale for Measuring Consumer Perceptions of Service Quality," *Journal of Retailing*, vol. 64, no. 1, pp. 12–37, Jan. 1988.
- [12] W. Wider *et al.*, "Service Quality (SERVQUAL) Model in Private Higher Education Institutions: A Bibliometric Analysis of Past, Present, and Future Prospects," *Social Sciences & Humanities Open*, vol. 9, 2024, Art. no. 100805, <https://doi.org/10.1016/j.ssaho.2024.100805>.
- [13] E. L. Deci and R. M. Ryan, "Cognitive Evaluation Theory," in *Intrinsic Motivation and Self-Determination in Human Behavior*, Boston, MA, USA: Springer US, 1985, pp. 43–85.
- [14] F. D. Davis, "Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology," *MIS Quarterly*, vol. 13, no. 3, Sept. 1989, Art. no. 319, <https://doi.org/10.2307/249008>.
- [15] A. I. A. Rahim, M. I. Ibrahim, K. I. Musa, S.-L. Chua, and N. M. Yaacob, "Patient Satisfaction and Hospital Quality of Care Evaluation in Malaysia Using SERVQUAL and Facebook," *Healthcare*, vol. 9, no. 10, Oct. 2021, Art. no. 1369, <https://doi.org/10.3390/healthcare9101369>.
- [16] P.-C. Lee, L.-L. Liang, M.-H. Huang, and C.-Y. Huang, "A Comparative Study of Positive and Negative Electronic Word-of-Mouth on the SERVQUAL Scale During the COVID-19 Epidemic - Taking a Regional Teaching Hospital in Taiwan as an Example," *BMC Health Services Research*, vol. 22, no. 1, Dec. 2022, Art. no. 1568, <https://doi.org/10.1186/s12913-022-08930-2>.
- [17] A. Jonkisz, P. Karniej, and D. Krasowska, "SERVQUAL Method as an 'Old New' Tool for Improving the Quality of Medical Services: A Literature Review," *International Journal of Environmental Research and Public Health*, vol. 18, no. 20, Oct. 2021, Art. no. 10758, <https://doi.org/10.3390/ijerph182010758>.
- [18] W. Huo, Q. Li, B. Liang, Y. Wang, and X. Li, "When Healthcare Professionals Use AI: Exploring Work Well-Being Through Psychological Needs Satisfaction and Job Complexity," *Behavioral Sciences*, vol. 15, no. 1, Jan. 2025, Art. no. 88, <https://doi.org/10.3390/bs15010088>.
- [19] S. Arslan Kurtuluş and E. Cengiz, "Customer Experience in Healthcare: Literature Review," *Istanbul Business Research*, vol. 51, no. 1, pp. 291–312, Jan. 2022, <https://doi.org/10.26650/ibr.2022.51.867283>.
- [20] G. L. Veenstra, K. F. A. A. Dabekaussen, E. Molleman, E. Heineman, and G. A. Welker, "Health Care Professionals' Motivation, Their Behaviors, and the Quality of Hospital Care: A Mixed-methods Systematic Review," *Health Care Management Review*, vol. 47, no. 2, pp. 155–167, Apr. 2022, <https://doi.org/10.1097/HMR.0000000000000284>.
- [21] N. M. Yunus, M. Z. Abdullah, N. F. Binti Ramdan, and H. A. S. B. S. Alnuaimi, "The Impact of Healthcare Service Quality on Patient Satisfaction at University Health Center," *Information Management and Business Review*, vol. 16, no. 3(I)S, pp. 440–451, Oct. 2024, [https://doi.org/10.22610/imbr.v16i3\(I\)S.4072](https://doi.org/10.22610/imbr.v16i3(I)S.4072).

- [22] R. Wulandari, I. P. Doddy, and L. Indaryani, "Measuring the Impact of Healthcare Service Quality of Hospitals on Customer Satisfaction," *Corporate and Business Strategy Review*, vol. 5, no. 1, special Issue, pp. 336–345, 2024, <https://doi.org/10.22495/cbsrv5i1siart8>.
- [23] S. H. Sharkiya, "Quality Communication Can Improve Patient-centred Health Outcomes Among Older Patients: A Rapid Review," *BMC Health Services Research*, vol. 23, no. 1, Aug. 2023, Art. no. 886, <https://doi.org/10.1186/s12913-023-09869-8>.
- [24] N. R. Espinoza Suarez, C. M. LaVecchia, K. M. Fischer, C. C. Kamath, and J. P. Brito, "Impact of Cost Conversation on Decision-Making Outcomes," *Mayo Clinic Proceedings: Innovations, Quality & Outcomes*, vol. 5, no. 4, pp. 802–810, Aug. 2021, <https://doi.org/10.1016/j.mayocpiqo.2021.05.006>.
- [25] D. Beal and K. J. Foli, "Affordability in Individuals' Healthcare Decision Making: A Concept Analysis," *Nursing Forum*, vol. 56, no. 1, pp. 188–193, Jan. 2021, <https://doi.org/10.1111/nuf.12518>.
- [26] R. Walsan *et al.*, "Is There an Association Between Out-of-pocket Hospital Costs, Quality and Care Outcomes? A Systematic Review of Contemporary Evidence," *BMC Health Services Research*, vol. 23, no. 1, Sept. 2023, Art. no. 984, <https://doi.org/10.1186/s12913-023-09941-3>.
- [27] J. Fang, L. Liu, and P. Fang, "What is the Most Important Factor Affecting Patient Satisfaction – a Study Based on Gamma Coefficient," *Patient Preference and Adherence*, vol. 13, pp. 515–525, Apr. 2019, <https://doi.org/10.2147/PPA.S197015>.
- [28] T. T. Lin, Y.-Q. Yeh, and S.-Y. Hsu, "Analysis of the Effects of Perceived Value, Price Sensitivity, Word-of-Mouth, and Customer Satisfaction on Repurchase Intentions of Safety Shoes under the Consideration of Sustainability," *Sustainability*, vol. 14, no. 24, Dec. 2022, Art. no. 16546, <https://doi.org/10.3390/su142416546>.
- [29] W. Alemu, E. Girma, and T. Mulugeta, "Patient Awareness and Role in Attaining Healthcare Quality: A Qualitative, Exploratory Study," *International Journal of Africa Nursing Sciences*, vol. 14, 2021, Art. no. 100278, <https://doi.org/10.1016/j.ijans.2021.100278>.
- [30] S. Liu, G. Li, N. Liu, and W. Hongwei, "The Impact of Patient Satisfaction on Patient Loyalty with the Mediating Effect of Patient Trust," *INQUIRY: The Journal of Health Care Organization, Provision, and Financing*, vol. 58, Jan. 2021, Art. no. 00469580211007221, <https://doi.org/10.1177/00469580211007221>.
- [31] H. Wang *et al.*, "Impact of Inpatient Self-efficacy and Trust in Physicians on Inpatient Satisfaction With Medical Services: The Mediating Role of Patient Participation in Medical Decision-making," *Frontiers in Psychology*, vol. 15, Aug. 2024, Art. no. 1364319, <https://doi.org/10.3389/fpsyg.2024.1364319>.
- [32] H. D. Hassan Kariri and A. Almubaddel, "From Theory to Practice: Revealing the Real-world Impact of Cognitive Behavioral Therapy in Psychological Disorders Through a Dynamic Bibliometric and Survey Study," *Heliyon*, vol. 10, no. 18, Sept. 2024, Art. no. e37763, <https://doi.org/10.1016/j.heliyon.2024.e37763>.
- [33] J. Morales, F. Silva-Aravena, and P. Saez, "Reducing Waiting Times to Improve Patient Satisfaction: A Hybrid Strategy for Decision Support Management," *Mathematics*, vol. 12, no. 23, Nov. 2024, Art. no. 3743, <https://doi.org/10.3390/math12233743>.
- [34] L. Shahmoradi, R. Safdari, H. Ahmadi, and M. Zahmatkeshan, "Clinical Decision Support Systems-based Interventions to Improve Medication Outcomes: A Systematic Literature Review on Features and Effects," *Medical Journal of The Islamic Republic of Iran*, Apr. 2021, <https://doi.org/10.47176/mjiri.35.27>.
- [35] J. Dingel, A.-K. Kleine, J. Cecil, A. L. Sigl, E. Lermer, and S. Gaube, "Predictors of Health Care Practitioners' Intention to Use AI-Enabled Clinical Decision Support Systems: Meta-Analysis Based on the Unified Theory of Acceptance and Use of Technology," *Journal of Medical Internet Research*, vol. 26, Aug. 2024, Art. no. e57224, <https://doi.org/10.2196/57224>.
- [36] S. H. Chan, "The Roles of User Motivation to Perform a Task and Decision Support System (DSS) Effectiveness and Efficiency in DSS Use," *Computers in Human Behavior*, vol. 25, no. 1, pp. 217–228, Jan. 2009, <https://doi.org/10.1016/j.chb.2008.09.002>.
- [37] Z. Chen *et al.*, "Harnessing the Power of Clinical Decision Support Systems: Challenges and Opportunities," *Open Heart*, vol. 10, no. 2, Nov. 2023, Art. no. e002432, <https://doi.org/10.1136/openhrt-2023-002432>.
- [38] N. Wiwatkunupakarn *et al.*, "The Integration of Clinical Decision Support Systems Into Telemedicine for Patients With Multimorbidity in Primary Care Settings: Scoping Review," *Journal of Medical Internet Research*, vol. 25, June 2023, Art. no. e45944, <https://doi.org/10.2196/45944>.
- [39] A. Kovari, "AI for Decision Support: Balancing Accuracy, Transparency, and Trust Across Sectors," *Information*, vol. 15, no. 11, Nov. 2024, Art. no. 725, <https://doi.org/10.3390/info15110725>.
- [40] N. X. Nguyen, K. Tran, and T. A. Nguyen, "Impact of Service Quality on In-Patients' Satisfaction, Perceived Value, and Customer Loyalty: A Mixed-Methods Study from a Developing Country," *Patient Preference and Adherence*, vol. 15, pp. 2523–2538, Nov. 2021, <https://doi.org/10.2147/PPA.S333586>.
- [41] D. A. Fitriani, S. A. Pasinringi, I. Irwandy, and H. Amqam, "The Effect of Perceived Value Toward Loyalty Through Patient Satisfaction in Hasanuddin University Hospital," *Enfermeria Clínica*, vol. 30, pp. 408–411, Mar. 2020, <https://doi.org/10.1016/j.enfcli.2019.11.008>.
- [42] F. Sausan, M. Solih, and Z. Hassan, "The Impact of Customer Perceived Value on Customer Satisfaction Mediated by Social and Emotion Values Associated with Aasandha Insurance Service in Maldives," Jan. 2025, <https://doi.org/10.5281/ZENODO.14599693>.
- [43] M. Blut, D. Chaney, R. Lunardo, R. Mencarelli, and D. Grewal, "Customer Perceived Value: A Comprehensive Meta-analysis," *Journal of Service Research*, vol. 27, no. 4, pp. 501–524, Nov. 2024, <https://doi.org/10.1177/10946705231222295>.
- [44] R. M. Baron and D. A. Kenny, "The Moderator–mediator Variable Distinction in Social Psychological Research: Conceptual, Strategic, and Statistical Considerations," *Journal of Personality and Social Psychology*, vol. 51, no. 6, pp. 1173–1182, 1986, <https://doi.org/10.1037/0022-3514.51.6.1173>.
- [45] X. Rao, L. Luo, J. Xiang, and X. Wang, "The Impact of Perceived Value, Customer Expectations, and Patient Experience on the Satisfaction of Contracted Patients in Hospitals," *BMC Health Services Research*, vol. 25, no. 1, Jan. 2025, Art. no. 7, <https://doi.org/10.1186/s12913-024-12118-1>.
- [46] S. K. Swathi, G. Barkur, and S. Somu, "Assessment of Healthcare Service Quality Effect on Patient Satisfaction and Care Outcomes: A Case Study in India," *Cogent Business & Management*, vol. 10, no. 3, Dec. 2023, Art. no. 2264579, <https://doi.org/10.1080/23311975.2023.2264579>.
- [47] Y. Ai *et al.*, "Determinants of Patients' Satisfaction and Trust Toward Healthcare Service Environment in General Practice Clinics," *Frontiers in Psychology*, vol. 13, July 2022, Art. no. 856750, <https://doi.org/10.3389/fpsyg.2022.856750>.
- [48] S. Liu *et al.*, "Evaluating Perceived Value and Expected Value Gaps Based on Patient Experience During Outpatient Encounters: An Empirical Study in China," *Heliyon*, vol. 10, no. 18, Sept. 2024, Art. no. e37766, <https://doi.org/10.1016/j.heliyon.2024.e37766>.
- [49] K. Yum and J. Kim, "The Influence of Perceived Value, Customer Satisfaction, and Trust on Loyalty in Entertainment Platforms," *Applied Sciences*, vol. 14, no. 13, July 2024, Art. no. 5763, <https://doi.org/10.3390/app14135763>.
- [50] K. Grechuta *et al.*, "Benefits of Clinical Decision Support Systems for the Management of Noncommunicable Chronic Diseases: Targeted Literature Review," *Interactive Journal of Medical Research*, vol. 13, Nov. 2024, Art. no. e58036, <https://doi.org/10.2196/58036>.
- [51] P. J. Fitzpatrick, "Improving Health Literacy Using the Power of Digital Communications to Achieve Better Health Outcomes for Patients and Practitioners," *Frontiers in Digital Health*, vol. 5, Nov. 2023, Art. no. 1264780, <https://doi.org/10.3389/fdgh.2023.1264780>.
- [52] F. AlOmari, "Measuring Gaps in Healthcare Quality Using SERVQUAL Model: Challenges and Opportunities in Developing Countries," *Measuring Business Excellence*, vol. 25, no. 4, pp. 407–420, Nov. 2021, <https://doi.org/10.1108/MBE-11-2019-0104>.
- [53] J. L. Haggerty and J.-F. Levesque, "Development of a Measure of Health Care Affordability Applicable in a Publicly Funded Universal Health

- Care System," *Canadian Journal of Public Health*, vol. 106, no. 2, pp. e66–e71, Jan. 2015, <https://doi.org/10.17269/CJPH.106.4562>.
- [54] D.-S. Chang, W.-L. Chen, and R. Wang, "Impact of the Bidirectional Relationship Between Communication and Cognitive Efficacy on Orthopedic Patient Adherence Behavior," *BMC Health Services Research*, vol. 22, no. 1, Feb. 2022, Art. no. 199, <https://doi.org/10.1186/s12913-022-07575-5>.
- [55] N. Ahmad, S. Du, F. Ahmed, N. Ul Amin, and X. Yi, "Healthcare Professionals Satisfaction and AI-based Clinical Decision Support System in Public Sector Hospitals During Health Crises: A Cross-sectional Study," *Information Technology and Management*, vol. 26, no. 2, pp. 205–217, June 2025, <https://doi.org/10.1007/s10799-023-00407-w>.
- [56] S. Liu, Y. Hu, C. Lu, D. Li, and Z. Zhang, "Identifying Patient Perceived Values During Outpatient Encounters: An Empirical Study From Chinese Public Hospitals," *BMC Health Services Research*, vol. 23, no. 1, Aug. 2023, Art. no. 852, <https://doi.org/10.1186/s12913-023-09817-6>.
- [57] D. Lee, "HEALTHQUAL: a Multi-item Scale for Assessing Healthcare Service Quality," *Service Business*, vol. 11, no. 3, pp. 491–516, Sept. 2017, <https://doi.org/10.1007/s11628-016-0317-2>.
- [58] M. L. Raposo, H. M. Alves, and P. A. Duarte, "Dimensions of Service Quality and Satisfaction in Healthcare: A Patient's Satisfaction Index," *Service Business*, vol. 3, no. 1, pp. 85–100, Mar. 2009, <https://doi.org/10.1007/s11628-008-0055-1>.
- [59] M. A. Memon, R. Thurasamy, H. Ting, and J.-H. Cheah, "Purposive Sampling: A Review and Guidelines for Quantitative Research," *Journal of Applied Structural Equation Modeling*, vol. 9, no. 1, pp. 1–23, Dec. 2024, [https://doi.org/10.47263/JASEM.9\(1\)01](https://doi.org/10.47263/JASEM.9(1)01).
- [60] J. F. Hair, C. M. Ringle, and M. Sarstedt, "PLS-SEM: Indeed a Silver Bullet," *Journal of Marketing Theory and Practice*, vol. 19, no. 2, pp. 139–152, Apr. 2011, <https://doi.org/10.2753/MTP1069-6679190202>.
- [61] J. Henseler, C. M. Ringle, and M. Sarstedt, "Testing Measurement Invariance of Composites Using Partial Least Squares," *International Marketing Review*, vol. 33, no. 3, pp. 405–431, May 2016, <https://doi.org/10.1108/IMR-09-2014-0304>.
- [62] "Statistical Yearbook of Indonesia 2023," Badan Pusat Statistik, Jakarta, Indonesia, Technical Report 03200.2303, Feb. 2023.
- [63] A. M. Alodhialah, A. A. Almutairi, and M. Almutairi, "Key Predictors of Patient Satisfaction and Loyalty in Saudi Healthcare Facilities: A Cross-Sectional Analysis," *Healthcare*, vol. 12, no. 20, Oct. 2024, Art. no. 2050, <https://doi.org/10.3390/healthcare12202050>.
- [64] D. C. Ferreira, I. Vieira, M. I. Pedro, P. Caldas, and M. Varela, "Patient Satisfaction with Healthcare Services and the Techniques Used for its Assessment: A Systematic Literature Review and a Bibliometric Analysis," *Healthcare*, vol. 11, no. 5, Feb. 2023, Art. no. 639, <https://doi.org/10.3390/healthcare11050639>.
- [65] J. F. Hair Jr., L. M. Matthews, R. L. Matthews, and M. Sarstedt, "PLS-SEM or CB-SEM: updated Guidelines on Which Method to Use," *International Journal of Multivariate Data Analysis*, vol. 1, no. 2, 2017, Art. no. 107, <https://doi.org/10.1504/IJMDA.2017.087624>.
- [66] T. T. Irawan, S. Hariani, T. S. Hwee, H. A. S. Malik, N. A. H. N. Abdullah, and A. Fakhrorazi, "Why Do Consumers Abandon the E-Carts?," *Journal of Theoretical and Applied Electronic Commerce Research*, vol. 20, no. 2, Mar. 2025, Art. no. 57, <https://doi.org/10.3390/jtaer20020057>.
- [67] H. Abdul Samee Malik, N. Ab Halim Nik Abdullah, and A. Fakhrorazi, "Understanding Customer Loyalty in Mobile Wallet Apps: A Post-pandemic Analysis With Customer Involvement as Moderator," *Innovative Marketing*, vol. 21, no. 1, pp. 338–349, Mar. 2025, [https://doi.org/10.21511/im.21\(1\).2025.27](https://doi.org/10.21511/im.21(1).2025.27).
- [68] N. Shrestha, "Factor Analysis as a Tool for Survey Analysis," *American Journal of Applied Mathematics and Statistics*, vol. 9, no. 1, pp. 4–11, Jan. 2021, <https://doi.org/10.12691/ajams-9-1-2>.
- [69] J. F. Hair, G. T. M. Hult, C. M. Ringle, M. Sarstedt, N. P. Danks, and S. Ray, "An Introduction to Structural Equation Modeling," in *Partial Least Squares Structural Equation Modeling (PLS-SEM) Using R*, Cham: Springer International Publishing, 2021, pp. 1–29.
- [70] C. Fornell and D. F. Larcker, "Evaluating Structural Equation Models with Unobservable Variables and Measurement Error," *Journal of Marketing Research*, vol. 18, no. 1, pp. 39–50, Feb. 1981, <https://doi.org/10.1177/002224378101800104>.
- [71] N. Kock, "Common Method Bias in PLS-SEM: A Full Collinearity Assessment Approach," *International Journal of e-Collaboration*, vol. 11, no. 4, pp. 1–10, Oct. 2015, <https://doi.org/10.4018/ijec.2015100101>.
- [72] C. A. Saliya, Ed., *Social Research Methodology and Publishing Results: A Guide to Non-native English Speakers*. Hershey, PA, USA: IGI Global, 2023.
- [73] J. F. Hair, J. J. Risher, M. Sarstedt, and C. M. Ringle, "When to Use and How to Report the Results of PLS-SEM," *European Business Review*, vol. 31, no. 1, pp. 2–24, Jan. 2019, <https://doi.org/10.1108/EBR-11-2018-0203>.
- [74] F. Manzoor, L. Wei, A. Hussain, M. Asif, and S. I. A. Shah, "Patient Satisfaction with Health Care Services; An Application of Physician's Behavior as a Moderator," *International Journal of Environmental Research and Public Health*, vol. 16, no. 18, Sept. 2019, Art. no. 3318, <https://doi.org/10.3390/ijerph16183318>.
- [75] O. Kitapci, C. Akdogan, and İ. T. Dortyol, "The Impact of Service Quality Dimensions on Patient Satisfaction, Repurchase Intentions and Word-of-Mouth Communication in the Public Healthcare Industry," *Procedia - Social and Behavioral Sciences*, vol. 148, pp. 161–169, Aug. 2014, <https://doi.org/10.1016/j.sbspro.2014.07.030>.
- [76] X. Chen, C. Liu, P. Yan, H. Wang, J. Xu, and K. Yao, "The Impact of Doctor-patient Communication on Patient Satisfaction in Outpatient Settings: Implications for Medical Training and Practice," *BMC Medical Education*, vol. 25, no. 1, June 2025, Art. no. 830, <https://doi.org/10.1186/s12909-025-07433-y>.
- [77] R. Shibl, M. Lawley, and J. Debuse, "Factors influencing decision support system acceptance," *Decision Support Systems*, vol. 54, no. 2, pp. 953–961, Jan. 2013, <https://doi.org/10.1016/j.dss.2012.09.018>.
- [78] R. K. Naik Jandavath and A. Byram, "Healthcare Service Quality Effect on Patient Satisfaction and Behavioural Intentions in Corporate Hospitals in India," *International Journal of Pharmaceutical and Healthcare Marketing*, vol. 10, no. 1, pp. 48–74, Apr. 2016, <https://doi.org/10.1108/IJPHM-07-2014-0043>.
- [79] M. H. Alanazi and B. Soh, "Behavioral Intention to Use IoT Technology in Healthcare Settings," *Engineering, Technology & Applied Science Research*, vol. 9, no. 5, pp. 4769–4774, Oct. 2019, <https://doi.org/10.48084/etasr.3063>.
- [80] J. Ye, B. Dong, and J.-Y. Lee, "The Long-term Impact of Service Empathy and Responsiveness on Customer Satisfaction and Profitability: A Longitudinal Investigation in a Healthcare Context," *Marketing Letters*, vol. 28, no. 4, pp. 551–564, Dec. 2017, <https://doi.org/10.1007/s11002-017-9429-2>.
- [81] V. Servetkienė, R. Puraonaitė, B. Mockevičienė, K. Ažukaitis, and D. Jankauskienė, "Determinants of Patient-Perceived Primary Healthcare Quality in Lithuania," *International Journal of Environmental Research and Public Health*, vol. 20, no. 6, Mar. 2023, Art. no. 4720, <https://doi.org/10.3390/ijerph20064720>.
- [82] M. Z. Rohman, Irwansyah, and W. E. Sari, "The Medical Facilities Selection Based on Location-Based Services Application Using SAW and TOPSIS Algorithm," *Journal of Physics: Conference Series*, vol. 1577, no. 1, July 2020, Art. no. 012012, <https://doi.org/10.1088/1742-6596/1577/1/012012>.
- [83] M. Z. Rohman, T. Bustomi, and W. E. Sari, "Decision Support System for Healthcare Location Selection," *3rd International Conference of Bio-based Economy for Application and Utility*, Padang, Indonesia, 2023, Art. no. 020035, <https://doi.org/10.1063/5.0120734>.