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Enhancing Patient Satisfaction Through Web-Based Registration and SEM Analysis of Service Quality Dimensions

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Abstract. A hospital that provides a wide range of healthcare services must prioritize the satisfaction of patients. Although many studies in Indonesia and Southeast Asia have examined factors influencing patient satisfaction, there is still limited empirical evidence that integrates the role of trust as a mediating variable using a comprehensive service quality model in the hospital context. This study aims to determine the service quality characteristics that influence patient satisfaction at Makassar City Regional General Hospital in Indonesia. Surveys were used to gather data from respondents, consisting of inpatients or their relatives aged 17 years or older, with a total of 300 samples. The data was analyzed using Structural Equation Modeling (SEM), which allows simultaneous testing of complex relationships among latent variables and provides robust estimates for both direct and indirect effects. The study's findings revealed that: (1) Trust was positively influenced by medical personnel attitude, medical services, and nursing care, with P values of 0.033, 0.000, and 0.012, respectively; (2) Trust had a positive effect on patient satisfaction, with a value of 0.000; and (3) Administrative procedures and tangible aspects did not positively affect trust, with P values of 0.345 and 0.106. To improve hospital services, particularly the administrative tasks, a web-based patient registration tool was created. In addition, the availability of ATMs should be considered to enhance tangible evidence indicators. The findings imply that hospital management should focus on strengthening the interpersonal and technical competencies of medical personnel while redesigning administrative systems to be more efficient and patient-friendly, as these factors ultimately drive trust and satisfaction levels.

Keywords: PLS-SEM, SERVQUAL, patients trust, web-based registration, public hospital services

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1. Introduction

In recent decades, the significance of the service sector in global economies has been recognized as a crucial catalyst for economic growth [1]. Governments and enterprises regard service management as a crucial and significant competitive advantage [2]. Organizations concentrate on attracting and retaining

clientele by converting prospects into devoted clients. They want to transform their acquired clients into loyal patrons, utilizing them as credible advocates to endorse their items [3]. Therefore, they must provide items or services that exceed customer expectations. The emphasis on meeting consumer expectations is particularly pronounced in the healthcare sector, characterized by narrow profit margins and increasing financial difficulties [4]. Furthermore, enhancing service quality and reducing expenses provide enterprises with a competitive edge in distinguishing themselves from competitors. Improving service quality is viewed not only as an expense for the company but also as a strategic method for attracting potential customers and increasing overall profitability [5]. The healthcare sector occupies a distinctive role among other service firms. This sector is essential for involving various society groups, principally responsible for ensuring and enhancing community health and well-being, particularly during pandemics [6]. Healthcare practitioners must maintain a superior standard of service, as even a slight error could jeopardize an individual's life [7].

A hospital delivers healthcare services to the community and is essential for enhancing the population's general well-being. We expect healthcare providers, especially hospitals, to enhance care quality by giving priority to treatment and preventive services. Hospitals must deliver superior services according to established criteria, ensuring accessibility for all demographic groups.

In late 2019, Indonesia faced a non-natural disaster marked by the COVID-19 pandemic, which impacted all sectors of government and commercial operations. The COVID-19 pandemic has profoundly altered numerous facets of human life [8]. Consequently, there exists a mechanism for various services during the COVID-19 pandemic that diminishes patient satisfaction for those seeking medical treatment.

Service quality, characterized by the anticipated benefits for consumers and their capacity to customize these advantages to fulfill their requirements, necessitates continual enhancement and maintenance at the highest standard. Recent research examines the correlation between company culture, performance, and patient satisfaction [9]. The other study investigated the relationship between satisfaction levels and survey response rates from patients in Swiss medical facilities [10].

Concerns have arisen regarding patient satisfaction in several contexts, including East Asia. Numerous research in Asia have examined patient satisfaction in private healthcare institutions and the quality of outpatient treatments. These studies analyzed data obtained from surveys focusing on particular aspects of healthcare services [11]. The professionalism, trustworthiness, and emergency management proficiency of the staff are linked to clinic accessibility and essential amenities like cleanliness [12].

The fundamental characteristic shared by all studies is their comprehensive approach, which goes beyond only evaluating treatment efficacy and the capacity of physicians to impact healthcare. The referenced study substantiates the notion that satisfaction is influenced by several circumstances, and it emphasizes patient engagement as a vital component of effective healthcare management.

However, most prior studies have focused on private institutions or outpatient services, with limited attention to public hospitals in Indonesia, particularly in the context of trust as a mediating variable. Furthermore, there is a gap in the literature regarding the simultaneous influence of various service quality dimensions such as medical service, nursing care, administrative procedures, and physical facilities on trust and satisfaction in a public hospital setting during or after a major health crisis.

This study seeks to address these gaps by examining the impact of service quality dimensions on patient satisfaction through the mediating role of trust at the Makassar City Regional General Hospital in Indonesia. The application of Structural Equation Modeling (SEM) allows for the simultaneous analysis of complex relationships between latent variables, offering a robust method to validate the proposed model and deepen understanding of service dynamics in the public healthcare context.

2. **Methods**

This research employed a modified SERVQUAL to identify the determinants of patient satisfaction at a public hospital in Makassar, as seen in Figure 1. Various factors, including administrative procedures,

tangible aspects, nursing care, the attitude of medical professionals, medical services, trust, and patient satisfaction, are examined with SEM (Structural Equation Modelling).

SERVQUAL was employed to examine customer satisfaction in South Korean retail enterprises. The results demonstrate that Reliability, Assurance, Tangibles, Empathy, and Responsiveness are critical factors influencing performance and leading to customer satisfaction. Additionally [13], examine SERVQUAL criteria to evaluate customer satisfaction in the airline industry. The study's findings demonstrate that tangible evidence has the most significant influence, followed by other criteria, leading to increased evaluations of customer satisfaction performance. A study from [14], focusses on the quality of referral hospital services from the patient's perspective. The medical personnel's confidence in patients positively influenced the hospital's overall performance. This suggests that sufficient coverage instils a sense of safety and security in patients concerning the services offered by the institution. Moreover, research conducted by [15], identifies tangibles as a vital component in the efficient delivery and satisfaction of utility services inside the Philippines government institutions.

This research has developed hypotheses as below.

H1: Administrative processes have a beneficial impact on trust
H2: Tangibles positively influence trust
H3: Nursing care positively influence trust
H4: The Attitude of healthcare staff positively influence trust
H5: Medical service positively influences trust

Patient trust is vital in healthcare, involving uncertainty and risk [16]. It is a firm belief in an individual or entity's reliability, precision, or competence. In healthcare, patient trust refers to a patient's confidence in the assumption that a physician, nurse, midwife, or other healthcare practitioner is dependable and sufficiently skilled to provide care. Consequently, we propose the following hypothesis:
H6: Trust positively influences patient satisfaction

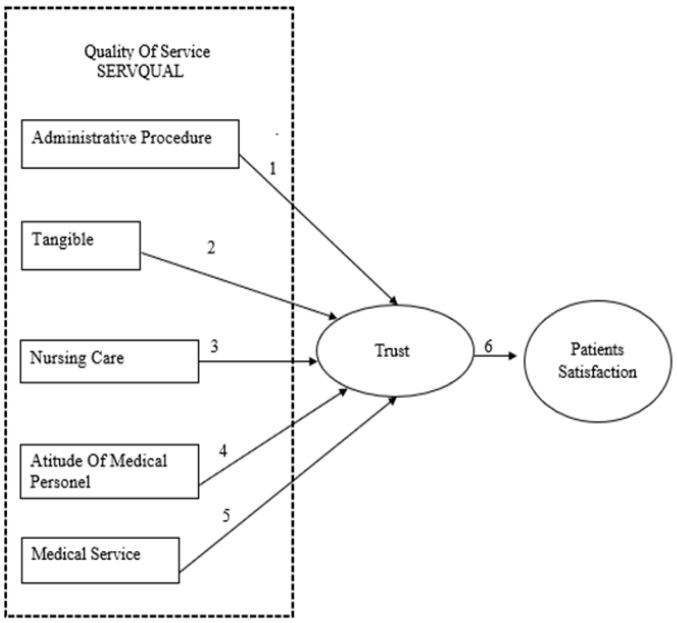

Figure 1. Research Framework

This study employed SEM analysis to provide results aligned with the standard distribution of research data criteria. This research utilised seven variables: administrative procedures, tangibles, nursing care, attitudes of medical workers, medical services, trust, and patient satisfaction. The decision

to perform SEM analysis is also due to several other factors that can predict and explain the objective construct.

Before full-scale data collection, a pilot test was conducted involving 30 respondents to assess the validity and reliability of the questionnaire. Expert judgment was used to ensure content validity, while construct validity was verified through factor loadings, with all items exceeding the recommended threshold of 0.70. Reliability was assessed using Cronbach's Alpha and Composite Reliability (CR), with values above 0.70, indicating strong internal consistency.

The final questionnaire included 34 indicators, and was distributed to 300 inpatients aged 17 years or older. This sample size was justified based on the recommendation by [17], who suggest that in PLS-SEM, the minimum sample size should be 10 times the largest number of structural paths pointing at any latent construct. In this study, the most complex construct received 5 paths, which suggests a minimum of 50 respondents. Therefore, 300 samples greatly exceed the minimum threshold, ensuring statistical robustness and adequate power to detect significant effects.

To minimize sampling bias, a purposive sampling method was employed with stratification across hospital wards to represent a variety of patient experiences. Data were collected at different times and days of the week to avoid time-based biases. Participation was voluntary and anonymous, which encouraged honest responses and reduced social desirability bias.

Data were collected using structured questionnaires with both closed-ended (Likert scale) and open-ended questions. The Likert scale ranged from 1 (strongly disagree) to 5 (strongly agree), allowing for quantifiable measurement of perceptions. The open-ended questions offered insights into qualitative aspects not captured through scaled items.

3. Results and Discussion

3.1. Demographics Results

Of the total participants, fifty-eight were males (19.3%), while two hundred forty-two were females (80.7%). The majority of participants, 47.0%, were between the ages of 17 and 27, while 34.3% were between the ages of 28 and 38. Table 1 provides a comprehensive examination of the respondents' characteristics, with housewives comprising the majority of this age group (58.3%).

Table 1. Descriptive Analysis of Respondent Profiles

Characteristics	Category	Frequency	Percentage
Age	From 17 to 27 years old	141	47.0%
	From 28 to 38 years old	103	34.3%
	From 39 to 49 years old	54	18.0%
	From 50 to 60 years old	2	0.7%
Gender	Man	58	19.3%
	Woman	242	80.7%
Job	Government employees	30	10.0%
	Self-employed	29	9.7%
	Police	6	2.0%
	Housewife	175	58.3%
	Other	60	20.0%
Educational background	Middle school	43	14.3%
	Secondary education	155	51.7%
	Bachelor's degree	89	29.7%
	Expert	2	0.7%
	Alternative	11	3.7%

3.2. Confirmatory Factor Analysis

Confirmatory factor analysis followed exploratory factor analysis. This facilitated the examination of the formulated hypotheses and the validation of the results. From this perspective, structural equation methods are applicable. Three criteria ensure the quality of the measurement model: namely (1) Reliability, (2) Convergent Validity, and (3) Discriminant Validity [18-19]. The results are shown in Table 2 below:

3.3. Reliability

This research employed Internal Consistency Reliability analysis to assess if the items utilized could gauge comparable constructs in scores [20].

Correlations greater than 0.6 were considered acceptable for all constructs, and items exhibiting weak associations with pertinent dimensions were removed. Items BF7 (loading 0.166) were omitted. To ensure the reliability of the measurements, we calculated the combined reliability index as per [20], which indicates a robust reliability standard if it equals 0.7. Table 3 demonstrates that the scale's reliability increased when the composite reliability exceeded 0.7. Furthermore, the average variance extracted (AVE) surpassed 0.5, so affirming the convergent validity of all components.

3.4. Discriminant Validation

We then proceed to the assessment of discriminant validity, which allows us to determine the extent to which a construct does not excessively affect alternative constructs. Two methods for evaluating discriminant validity include cross-loading analysis and the comparison of the square root of the Average Variance Extracted (AVE) score. The findings are illustrated in Tables 4 and 5, demonstrating that both convergent and discriminant validity are confirmed, hence verifying the measurement model shown in Figure 2.

3.5. Assessment of Structural Models

Testing Research Hypotheses

A validity test was conducted before evaluating the relationships between variables in the conceptual model. This involves considering the criteria to illustrate the relationship between the endogenous and exogenous variables in the model. To this end, we employed a sample of 300 and implemented bootstrapping methods in Smart PLS, with the results presented in Table 6.

Table 2. Confirmatory Factor Analysis

	Administrative Procedure	**Attitude of Medical Personnel**	**Medical Service**	**Nursing Care**	**Patients Satisfaction**	**Tangible**	**Trust**
BF1						0.742	
BF2						0.793	
BF3						0.782	
BF4						0.835	
BF5						0.758	
BF6						0.696	
BF8						0.74	
KN1							0.91
KN2							0.945
KN3							0.909

KPN1				0.831
KPN2				0.906
KPN3				0.901
KPN4				0.839
KPT1			0.822	
KPT2			0.861	
KPT3			0.888	
KPT4			0.778	
KPT5			0.8	
LM1		0.75		
LM2		0.848		
LM3		0.887		
LM4		0.866		
PA1	0.791			
PA2	0.804			
PA3	0.804			
PA4	0.761			
PA5	0.845			
PA6	0.83			
STM1	0.779			
STM2	0.873			
STM3	0.883			
STM4	0.795			
STM5	0.834			

Table 3. Construct Reliability and Validity Values

	Cronbach's Alpha	**rho_A**	**Composite Reliability**	**Average Variance Extracted (AVE)**
Administrative Procedure	0.892	0.895	0.917	0.65
Attitude of Medical Personnel	0.89	0.902	0.919	0.695
Medical Service	0.861	0.887	0.905	0.705
Nursing Care	0.887	0.891	0.917	0.69
Patients Satisfaction	0.893	0.903	0.925	0.757
Tangible	0.882	0.885	0.908	0.585
Trust	0.911	0.912	0.944	0.85

Table 4. Cross Loading Analysis

	Administrative Procedure	Attitude of Medical Personnel	Medical Service	Nursing Care	Patients Satisfaction	Tangible	Trust
BF1	0.273	0.563	0.536	0.484	0.489	0.742	0.419
BF2	0.273	0.621	0.556	0.526	0.506	0.793	0.47
BF3	0.381	0.582	0.548	0.49	0.468	0.782	0.483
BF4	0.337	0.658	0.613	0.538	0.589	0.835	0.563
BF5	0.352	0.531	0.533	0.536	0.487	0.758	0.508
BF6	0.285	0.554	0.588	0.518	0.5	0.696	0.616
BF8	0.23	0.642	0.594	0.62	0.558	0.74	0.603
KN1	0.361	0.679	0.75	0.688	0.622	0.589	0.91
KN2	0.387	0.662	0.704	0.635	0.686	0.657	0.945
KN3	0.353	0.654	0.721	0.643	0.71	0.681	0.909
KPN1	0.428	0.675	0.665	0.655	0.831	0.697	0.705
KPN2	0.399	0.651	0.629	0.593	0.906	0.572	0.671
KPN3	0.405	0.59	0.586	0.514	0.901	0.576	0.629
KPN4	0.388	0.473	0.45	0.404	0.839	0.481	0.498
KPT1	0.381	0.659	0.657	0.822	0.585	0.609	0.658
KPT2	0.299	0.595	0.604	0.861	0.517	0.56	0.622
KPT3	0.29	0.6	0.648	0.888	0.569	0.6	0.566
KPT4	0.382	0.536	0.597	0.778	0.49	0.537	0.52
KPT5	0.303	0.566	0.588	0.8	0.466	0.599	0.566
LM1	0.361	0.671	0.75	0.533	0.531	0.65	0.495
LM2	0.347	0.648	0.848	0.63	0.573	0.601	0.615
LM3	0.355	0.581	0.887	0.67	0.588	0.616	0.664
LM4	0.337	0.69	0.866	0.658	0.594	0.656	0.807
PA1	0.791	0.299	0.292	0.284	0.392	0.285	0.286
PA2	0.804	0.32	0.333	0.308	0.335	0.302	0.288
PA3	0.804	0.365	0.351	0.327	0.349	0.335	0.312
PA4	0.761	0.444	0.431	0.398	0.377	0.391	0.367
PA5	0.845	0.299	0.268	0.275	0.374	0.266	0.328
PA6	0.83	0.292	0.301	0.318	0.425	0.328	0.327
STM1	0.347	0.779	0.663	0.674	0.55	0.632	0.562
STM2	0.347	0.873	0.666	0.65	0.626	0.643	0.684
STM3	0.393	0.883	0.602	0.601	0.596	0.654	0.605
STM4	0.325	0.795	0.545	0.486	0.479	0.642	0.447
STM5	0.347	0.834	0.702	0.554	0.628	0.688	0.659

Using six criteria, we established a significant correlation among the five exogenous elements:attitude of medical personnel, medical services, nursing care, tangibles, administrative procedure and the endogenous factor, patient satisfaction

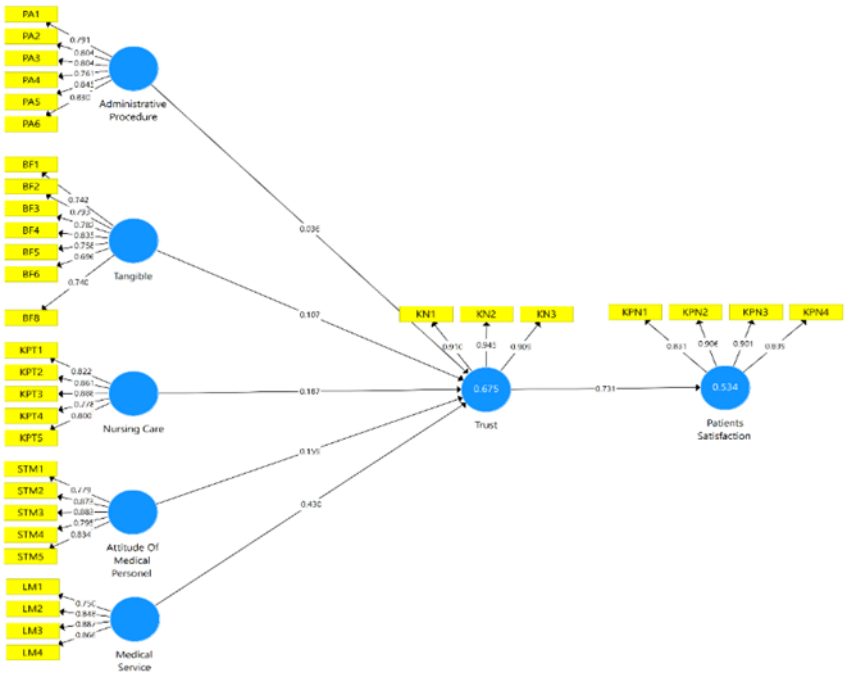

Figure 2. Measurement Model After Adjustment

Table 5. Discriminant Validity

	Administrative Procedure	Attitude of Medical Personnel	Medical Service	Nursing Care	Patients Satisfaction	Tangible	Trust
Administrative Procedure	0.806						
Attitude of Medical Personnel	0.422	0.834					
Medical Service	0.413	0.767	0.839				
Nursing Care	0.398	0.715	0.746	0.831			
Patients Satisfaction	0.467	0.698	0.681	0.635	0.87		
Tangible	0.398	0.78	0.748	0.701	0.678	0.765	

Trust	0.398	0.721	0.786	0.711	0.731	0.698	0.922

Table 6. Result of Hypothesis Testing

	Original Sample (O)	**Sample Mean (M)**	**Standard Deviation (STDEV)**	**T Statistics (|O/STDEV|)**	**P-Values**	
Administrative Procedure -> Trust	0.036	0.037	0.039	0.945	0.345	Rejected
Attitude of Medical Personnel -> Trust	0.159	0.156	0.074	2.14	0.033	Accepted
Medical Service -> Trust	0.43	0.427	0.053	8.111	0	Accepted
Nursing Care -> Trust	0.187	0.19	0.074	2.534	0.012	Accepted
Tangible -> Trust	0.107	0.112	0.066	1.62	0.106	Rejected
Trust -> Patient Satisfaction	0.731	0.728	0.039	18.666	0	Accepted

R2 (The coefficient of determination).
We assessed the explanatory capacity of our model by computing the coefficient of determination R2 using Smart PLS software. A coefficient of determination, R^2, exceeding 0.1 signifies that the model possesses adequate explanatory power (refer to Table 7).

Stone-Geisser's coefficient (Q2).
We utilize the "Blindfolding" method in Smart PLS software to calculate the Q2 index. Table 8 indicates that the Q2 value in our model was (0.387 and 0.562 > 0) and a positive integer (not equal to zero). Consequently, we ascertain that our model demonstrates predictive capability.

Table 7. The Coefficient of Determination R^2

	R-squared	**R-squared Adjusted**
Patients Satisfaction	0.534	0.532
Trust	0.675	0.669

Table 8. The Predicting Capability of The Construct

	SSO	**SSE**	**Q^2 (=1-SSE/SSO)**
Patients Satisfaction	1200	735.078	0.387

Trust	900	394.251	0.562

3.6. Administrative Procedure

Hospital administration include patient admission, duration of hospital stays, and discharge, arranging clinical consultations and managing wait times, as well as administrative procedures to ensure a favorable experience [21]. The study's findings suggest that administrative processes do not enhance trust. This indicates that elements contribute to the patient's diminished trust in administrative procedural services, leading to dissatisfaction.

3.7. Attitude of Medical Personnel

It concerns the quality of all individuals involved in the service, including doctors, nurses, paramedics, and support staff. Clients expect staff to deliver prompt, reliable, courteous, authentic, and proficient services. Pleasant and courteous staff enhanced patients' perceptions of the institution. The findings indicate that the attitude of medical personnel positively affects trust. Attitudes denote individuals' views and emotions concerning people, situations, and objects [22]. Nonetheless, every attitude, whether constructive or destructive, suitable or unsuitable, is cultivated for a specific purpose, especially when it is reflected in behavior [23-24].

3.8. Medical Service

Satisfaction acts as the intermediary factor between perceived service quality and customer loyalty; when service quality meets expectations, customers are likely to feel satisfied, which influences their loyalty [25]. When the quality of service provided above anticipated standards, customers see the service quality as superior, which consequently affects their satisfaction and intention of repurchase [26]. To enhance patient satisfaction with healthcare services by providing superior quality medical treatment and to increase their propensity to return through referrals, it is crucial to offer customized services that reflect the distinct characteristics of the patients. The study indicates that medical services enhance trust.

3.9. Nursing Care

Nurses are the largest segment of the healthcare workforce, providing primary care and allocating more time to patients than other staff members [27]. The patient's experience and evaluation indicate the nurse's concern [28]. The hospital has similarly achieved a good influence on nurses' confidence through its initiatives.

3.10. Tangibles

The analysis indicates that tangible evidence does not positively influence trust, implying that the indications are weak. Tangible evidence includes physical resources, tools, personnel, and communication assets within healthcare organizations, contrasting with the conclusions of the studies conducted by [29]. Nurses significantly influence the efficacy of breastfeeding by offering emotional, informational, and genuine support during the process. Physical evidence denotes a firm or hospital's ability to demonstrate its existence to external entities.

3.11. Consequences of Trust Within the Comprehensive Healthcare System

Trust is a foundational element of the connection between patients and healthcare professionals. A patient's faith in the healthcare system directly influences treatment efficacy, compliance with medical advice, use of preventative services, and patient referral rates. Elevated trust levels promote patients' openness regarding grievances, adherence to treatment protocols, and willingness to attend follow-up appointments. Consequently, establishing and sustaining trust is not solely the obligation of individual healthcare professionals but also indicative of administrative and institutional proficiency in delivering excellent, transparent, and compassionate services.

In public healthcare systems, especially in developing nations, patient trust is intricately associated with perceptions of medical personnel professionalism, service reliability, and transparency of administrative processes. Trust functions as a crucial mediating variable that connects perceptions of service quality with total patient happiness and loyalty.

3.12. Comparison of Findings with Comparable Research in Southeast Asia

This study's findings demonstrate that the attitudes of medical workers, medical services, and nursing care positively affect patient trust, however administrative procedures and concrete proof do not exhibit a significant influence. These findings correspond with research conducted in various Southeast Asian nations.

A research conducted in Laos by [30] found that the dimensions of empathy, assurance, and reliability, derived from healthcare personnel's behavior, significantly influenced patient satisfaction and confidence more than the facility's physical attributes. A study conducted by [31] on Malaysian hospitals revealed that patients valued interpersonal service and effective communication from personnel more than the quality of physical facilities or administrative procedures.

In various other studies, including those conducted in the Philippines, tangible elements and administrative factors significantly impacted perceptions of service quality. This disparity may be attributed to local context, patient expectations, and the state of hospital facilities, hence highlighting the significance of a contextual approach in evaluating service quality across areas.

3.13. Explanations for the Ineffectiveness of Administrative Variables and Empirical Evidence Affecting Trust

This study's results demonstrate that administrative procedures and tangible factors do not much influence the development of patient trust. This can be elucidated by various factors:

1. Emotional and personal detachment: Administrative protocols and physical environments are often mechanical and fail to consider the emotional dimensions of patients. Trust is built by cordial, empathic, and professional interpersonal engagements.
2. Adverse encounters with hospital bureaucracy: A considerable number of patients in public hospitals regard administrative procedures as sluggish, ineffective, or perplexing. Although administrative processes are crucial for delivering treatment, poor management can negatively impact the institution's overall reputation.
3. Diminished expectations for physical facilities: Patients may possess inherently low expectations concerning the condition of public hospitals; thus, the existence of modern or pristine facilities does not necessarily enhance trust.
4. Disconnection from medical outcomes: In contrast to contacts with physicians or nurses, which are viewed as immediately influencing patient safety and health, physical facilities or administrative aspects are frequently regarded as having no direct effect on treatment efficacy.

3.14. Web Based Registration

Consequent to the aforementioned discussion, a web-based patient registration service may be developed to enhance patient satisfaction. The subsequent framework and web-based application were created in accordance with the recommendations from the analysis phase.

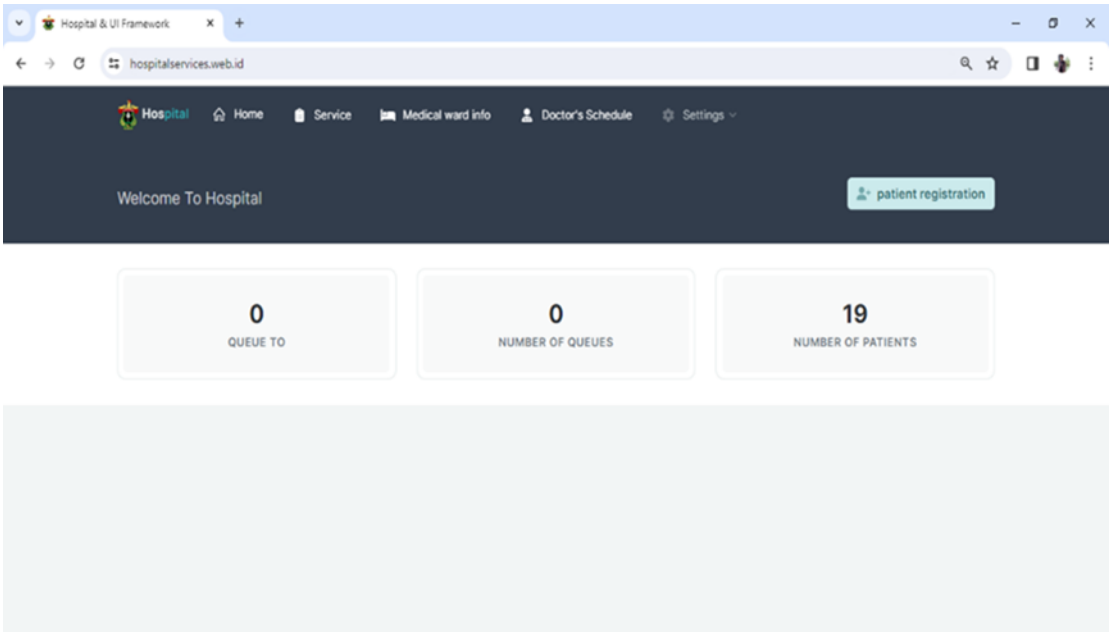

Figure 3. Patient Registration Service Display

As seen in Fig. 3, the homepage of the website displays several menus, such as Home, Service, Medical Ward Info, Doctors' Schedule, Settings, and Patient Registration. The Queue Ticket display shows the patient's queue position, the Number of Queues display shows the number of people in the queue, and the Number of Patients display shows the number of registered patients in a given day.

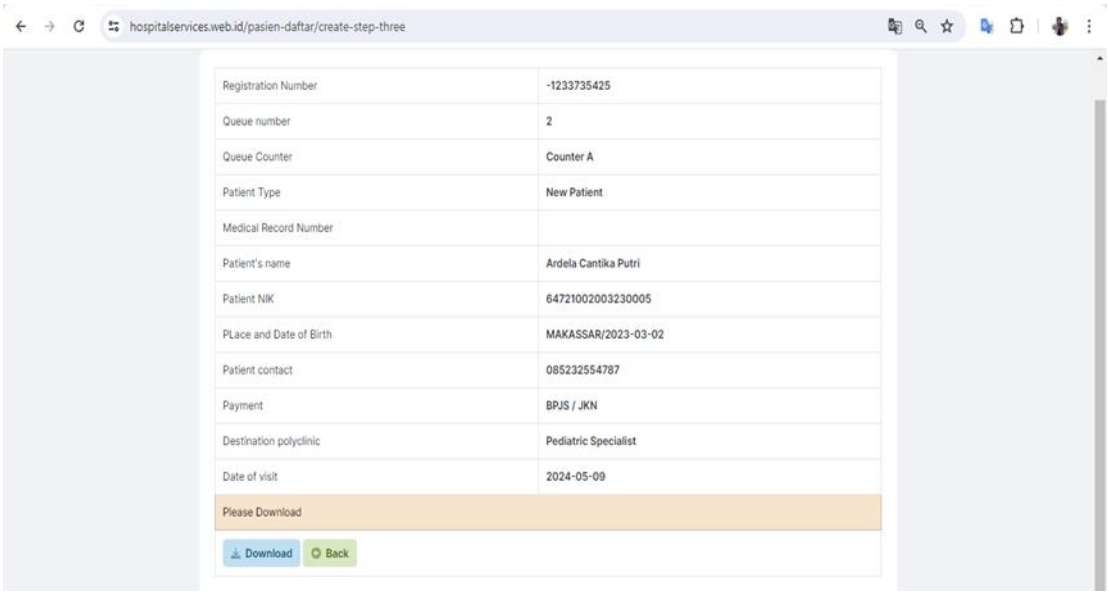

Figure 4. Queue Ticket Display

On the queue ticket display (see Fig. 4), there is direct information about the queue ticket that has been filled in previously by the patient and can be downloaded.

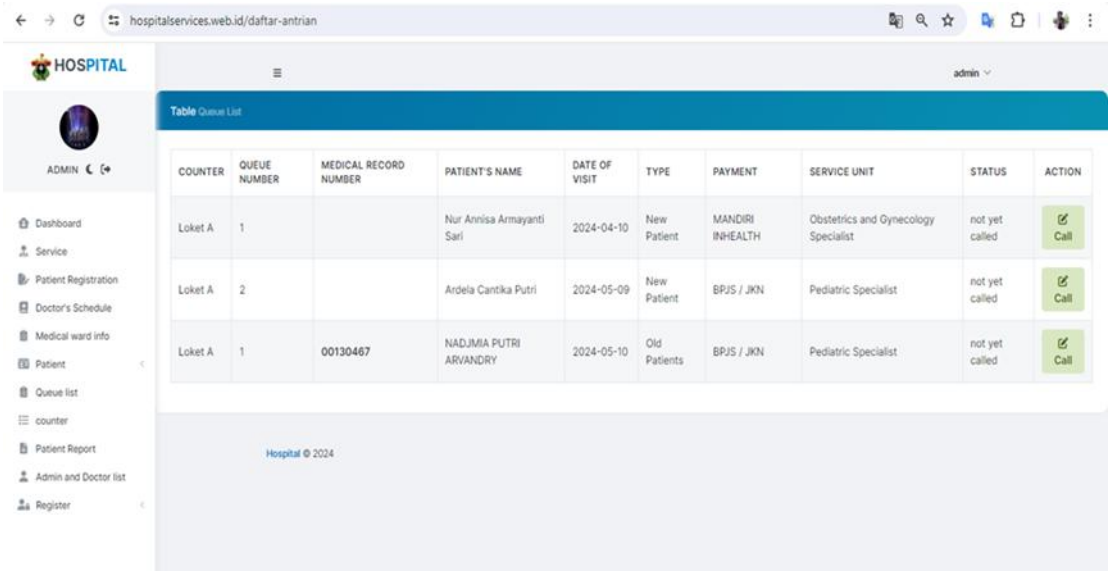

Figure 5. Display of Queue Lines

In the display of the queue lines as presented in Fig. 5, there is data on patients who have registered, so the admin can click call on the first registered patient and so on.

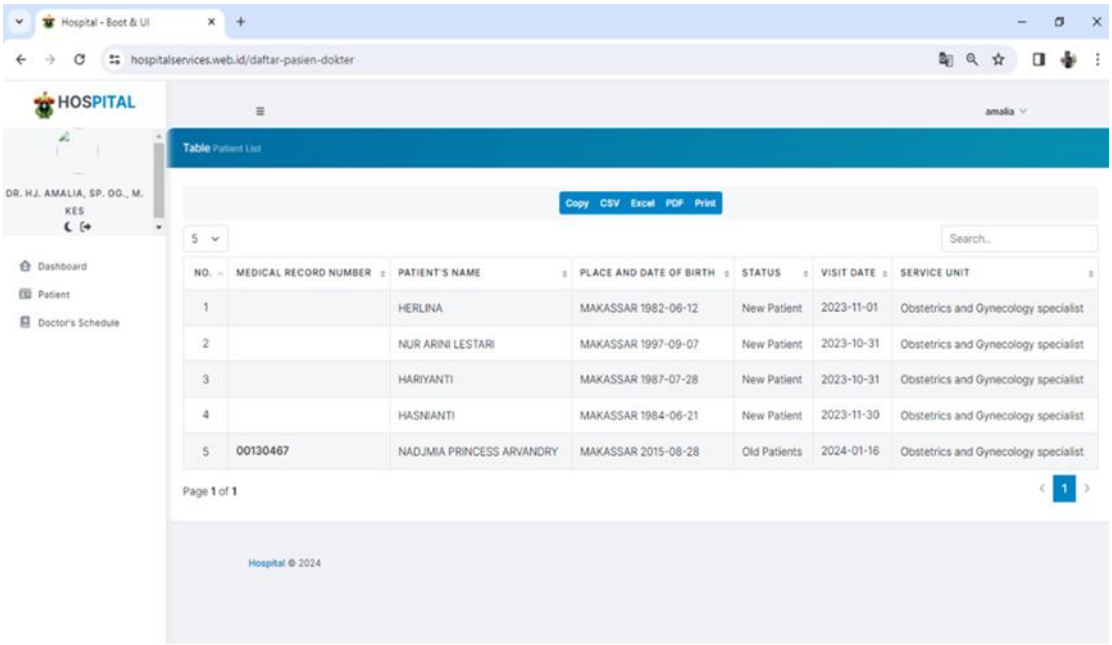

Figure 6. Doctor's Dashboard View

On the dashboard display as in Fig. 6, doctors can see how many patients have not been examined, how many patients have been examined and the total number of patients registered today.

The dashboard display above addresses issues in the patient satisfaction indicator by utilizing web-based patient services to facilitate registration without requiring patients to visit the hospital first. The patient has the option to select the physician for their examination in the hospital. Administrators of web-based patient services can monitor and organize incoming data, while each physician can instantly access the list of patients awaiting examination.

4. Conclusion

The study indicates that among the six dimensions of service quality, only the attitude of medical staff, medical services, nursing care, and trust had a positive impact on patient satisfaction, with p values of 0.033, 0.000, 0.012, and 0.000, respectively. Conversely, administrative processes and physical evidence did not influence patient satisfaction via trust, with p values of 0.345 and 0.106, respectively. The hospital must prioritize recommendations aimed at enhancing patient satisfaction through administrative procedures and physical evidence factors, including the implementation of a web-based patient service system and the provision of ATM facilities.

From a practical management perspective, hospital leaders can use these findings to focus resource allocation and staff training on improving interpersonal interactions, optimizing clinical service delivery, and ensuring nursing care responsiveness. Furthermore, streamlining administrative workflows through digital platforms and enhancing tangible facilities can address existing service gaps.

For future research, it is recommended to replicate and test this structural model in different healthcare environments such as private hospitals, rural health centers, or specialized clinics to validate the robustness of the findings across contexts. Expanding the model to incorporate other potential mediators or moderators, such as patient demographics or perceived value, could also provide deeper insights into the mechanisms driving patient satisfaction in healthcare services.

Declaration of AI and AI assisted technologies in the writing process

The author confirms that no Artificial Intelligence (AI) tools were used in the development, writing, or preparation if this manuscript.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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