SERVICE QUALITY AND E-HEALTH LITERACY IMPACT ON ELDERLY PATIENT LOYALTY AT HOSPITAL X

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Abstract

The aging population increasingly relies on healthcare services, demanding that hospitals identify factors influencing elderly patients' revisit intentions. However, limited studies integrate service quality and digital literacy factors. Thus, this research addresses how service quality dimensions and e-health literacy affect elderly patients' revisit intentions mediated by customer perceived value (CPV) and customer satisfaction (CS). The objectives were to examine the direct and indirect effects of service quality and e-health literacy on revisit intention, with CPV and CS as mediators. A cross-sectional survey employing standardized questionnaires was conducted among approximately 100 elderly outpatients at Hospital X. Partial Least Squares Structural Equation Modeling (PLS-SEM) was utilized to analyze the data. Results showed that only emotion and trust significantly influenced CPV, while e-health literacy had the strongest impact on CS. CPV did not directly affect revisit intention, but CS did, indicating that satisfaction fully mediated the effect of e-health literacy on revisit intention. The key significant path coefficients were emotion to CPV ($\beta \approx .42$, $p<.01$), trust to CPV ($\beta \approx .18$, $p<.05$), e-health literacy to satisfaction ($\beta \approx .55$, $p<.001$), and satisfaction to revisit intention ($\beta \approx .53$, $p<.001$). These findings highlight the crucial role of enhancing service quality and e-health literacy among elderly patients to improve their perceived value and satisfaction, ultimately increasing revisit intentions. The implications suggest healthcare management should prioritize high-quality services and digital health literacy programs for elderly patients.

Keywords: Service Quality, E-Health Literacy, Perceived Value, Customer Satisfaction, Revisit Intention, Elderly Patients

INTRODUCTION

The global healthcare sector is undergoing a profound digital transformation, which serves as a primary catalyst for enhancing patient accessibility, operational efficiency, and overall service quality (WHO et al., 2023). In Indonesia, this digitalization initiative is articulated within the Ministry of Health's Strategic Plan for 2020–2024, emphasizing the integration of information technology to mitigate disparities in healthcare service delivery (Kemenkes RI, 2022)). However, the implementation of such policies is not without its complexities, particularly concerning existing gaps in digital literacy and a prevalent resistance to transitioning from established manual systems (Correa & Limos-Galay, 2024). Within this evolving landscape, particular attention must be directed towards the elderly patient demographic, especially in the context of digitalizing registration systems and improving service quality at private healthcare facilities like Hospital X in West Jakarta. Elderly patients frequently encounter a myriad of challenges when accessing healthcare services, including limitations in mobility and difficulties in comprehending and interacting with new technologies (Wilson et al., 2021). Despite these challenges, the digitalization of registration processes offers substantial benefits for this demographic, such as enabling remote registration, providing easily accessible information, and accelerating administrative procedures (De Rosis et al., 2020; Xie et al., 2019).

The need for adapted healthcare services for the elderly is further underscored by significant demographic shifts. In Jakarta, the elderly population reached 1,083,720 individuals in 2022 and is projected to increase to approximately 1.2 million by 2025 (Alpitasari, 2023). This suggests that many elderly individuals are in their early productive years and possess the potential for digital engagement, provided adequate support and education are available (Zhang et al., 2024). This growing segment represents a critical patient base for hospitals. Internal data from Hospital X reveals that nearly 69% of all patient visits in 2024 (101,914 out of 146,885) were repeat visits by elderly patients. This high proportion signifies the immense importance of this demographic for the hospital's sustained operations and underscores the imperative for service quality that ensures their satisfaction. A significant operational challenge at Hospital X, which directly impacts patient satisfaction, is the persistent discrepancy between mandated outpatient waiting times and actual service delivery. National regulations, such as the Regulation of the Minister of Health No. 30 of 2022 and BPJS Kesehatan Regulation No. 2 of 2015, stipulate a maximum outpatient waiting time of 60 minutes from registration to physician consultation. However, in 2023, Hospital X's average outpatient waiting time was approximately 2 hours, substantially exceeding the regulatory standard. This inefficiency, largely attributed to reliance on manual queuing systems across various service stages (admission, polyclinic, pharmacy), poses a considerable risk to patient satisfaction and loyalty, particularly among JKN participants who have flexibility in choosing referral hospitals (Asiam & Gunawan, 2024; Suhadi, 2022). Consequently, digitalization is viewed as a systemic strategy to streamline service flows, minimize queues, and continuously enhance service quality (Xie et al., 2019).

The increasing competition within the healthcare industry, coupled with heightened patient awareness of their rights and needs, necessitates a paradigm shift from a supplier-oriented to a customer-oriented approach in hospital management (Almunawar & Anshari, 2011). Superior service quality is recognized as a pivotal factor in achieving patient satisfaction and fostering their intention to revisit (Rauf et al., 2024). Beyond direct service

quality, Customer Perceived Value (CPV) plays an equally crucial role in influencing patient satisfaction and loyalty. CPV represents a patient's holistic assessment of the benefits derived from a service in relation to the costs or sacrifices incurred, which include not only financial outlays but also time, effort, and psychological aspects (Ikramuddin & Mariyudi, 2021; Nguyen et al., 2021). For elderly patients, who often have ongoing health needs and are more sensitive to costs, ensuring they perceive commensurate value from healthcare services is paramount for retaining them as regular patrons (Maesaroh et al., 2022; Von Wedel et al., 2022).

Given this background, the present study aims to investigate the influence of digital registration systems on patient loyalty at Hospital X. It employs a dual theoretical lens, integrating the Service Quality model (Nguyen et al., 2021; Parasuraman et al., 1988) and the Technology Acceptance Model (Grönroos et al., 2003). The study positions four dimensions of service quality function, emotion, trust, and social influence—as independent variables. Concurrently, customer perceived value, customer satisfaction, and e-health literacy are utilized to explore how perceptions of the usefulness and ease of use of digital systems shape patient loyalty. This integrated model is designed to offer a more comprehensive understanding of the factors influencing elderly patient loyalty amidst the ongoing digitalization of healthcare services. The expectation is that digitalization, through platforms like the Mobile JKN application, will cultivate a positive perception of overall hospital service quality. To empirically analyze these complex inter-variable relationships, the study employs Partial Least Squares Structural Equation Modeling (PLS-SEM), a robust approach for examining both direct and indirect effects on patient loyalty.

REVIEW OF LITERATURE

Service quality and e-health literacy are key factors influencing elderly patient loyalty in hospitals. High service quality, including responsiveness and reliability, enhances patient satisfaction and trust, while greater e-health literacy enables elderly patients to effectively access and use digital health information. Together, these factors contribute to stronger patient engagement and long-term loyalty to healthcare institutions.

RESEARCH METHOD

This study conducted a bibliometric analysis to identify current trends, research hotspots, and theoretical gaps in the domain of digital health with particular attention to e-health literacy, patient satisfaction, and digital revisit intention. The dataset was derived from the Scopus database covering the publication range between 2018 and 2024. The selection was limited to peer-reviewed journal articles written in English. After refining for relevance and eliminating duplicates or non-article records, a total of 98 documents were included in the final analysis. This literature mapping approach follows the systematic guidance of, which recommends bibliometric analysis as a robust tool to uncover intellectual structures, monitor scientific evolution, and validate research novelty (Burgers et al., 2019; Linnenluecke et al., 2019). This method allowed the current study to ensure that its proposed

model addresses a niche intersection between digital service quality and aging patient behavior, which has not yet been extensively theorized or empirically tested.

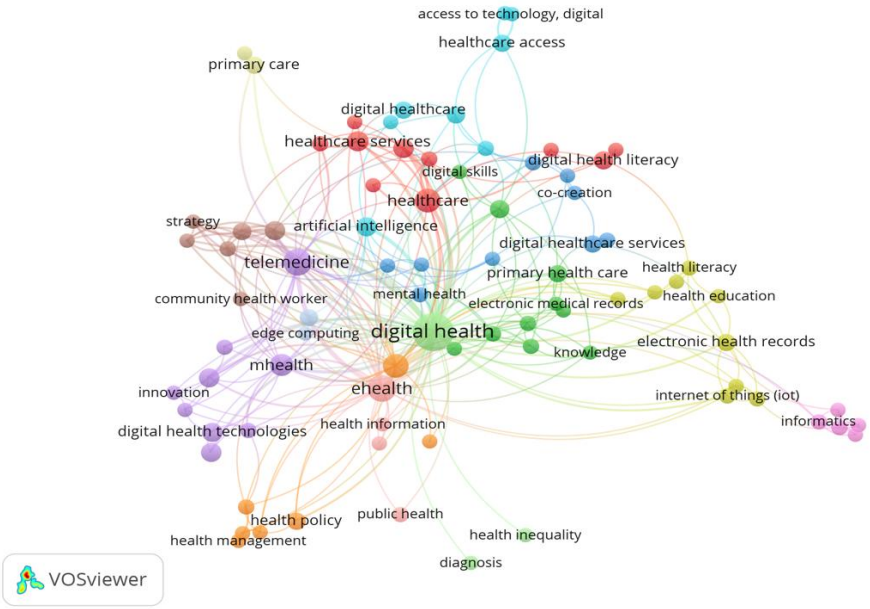

Figure 1.
Bibliometric Map (Co-occurrence Network Analysis)
Source: Scopus (2025), processed with VOSviewer 1.6.20

This study aims to address this gap by integrating service quality theory, technology acceptance models, and health literacy frameworks to explore revisit intention in digital service usage. Using PLS-SEM and IPMA, it connects functional and emotional service quality dimensions with behavioral outcomes, positioning e-health literacy as a foundational rather than a moderating factor. The research thus contributes to digital health literature by focusing on the experiences of elderly users and emphasizing the significance of inclusive digital service design in healthcare. Furthermore, this study utilized a cross-sectional quantitative design, sampling 100 elderly patients from Hospital X, Jakarta, employing convenience sampling. Data were collected from 100 fully completed questionnaires and analyzed based on six aspects: gender, age, education, insurance status, visit frequency, and mode of arrival. The table below summarizes these characteristics.

Table 1.
Respondents' Demographic Characteristics

No	Category	Subcategory	Frequency	Percentage (%)
1	Gender	Female	60	60.00%
		Male	40	40.00%
2	Age	60–69 years	57	57.00%
		70–79 years	33	33.00%
		≥80 years	9	9.00%

		<60 years	1	1.00%
3	Education Level	Primary School or below	30	30.00%
		Senior High School	28	28.00%
		Junior High School	25	25.00%
		College/University	14	14.00%
		No formal education	3	3.00%
4	Insurance Status	BPJS	100	100.00%
5	Visit Frequency	3–6 times	67	67.00%
		Once	10	10.00%
		2–3 times	9	9.00%
		12 times	8	8.00%
		More than 6 times	6	6.00%
6	Mode of Arrival	Accompanied by family	51	51.00%
		Came alone	48	48.00%
		Others	1	1.00%

Data collection was conducted using structured questionnaires distributed directly to the respondents. Data analysis employed Partial Least Squares Structural Equation Modeling (PLS-SEM) to explore relationships among the constructs, supported by Importance-Performance Mapping Analysis (IPMA) to identify critical improvement areas (Hair et al., 2020). This method enabled a comprehensive understanding of factors influencing elderly patients' revisit intentions in a digitally-enabled healthcare setting.

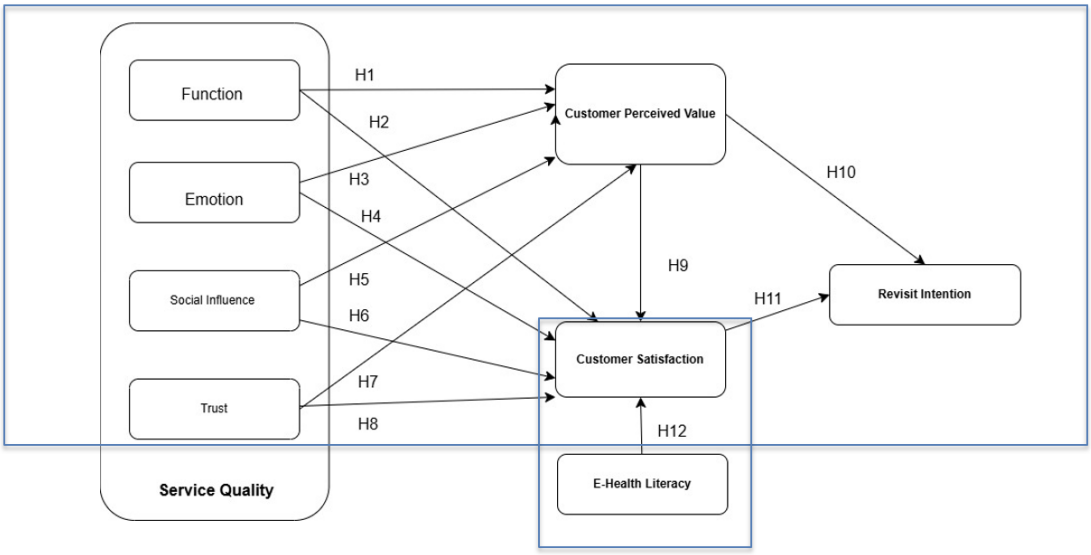

Figure 2.
Conceptual Framework
Source: Modification of Nguyen et al. (2021) and Yu et al. (2025)

The variables were operationalized using validated instruments from previous literature. Service Quality was measured through four dimensions: function, emotion, trust, and social influence, adapted from Nguyen et al. (2021). Customer Perceived Value was assessed based on indicators such as service quality perception, patient effort, and cost-benefit value (Nguyen et al., 2021). Customer Satisfaction incorporated overall satisfaction, expectation fulfillment, and the perceived wisdom of the decision to use digital services (Anabir, 2023). E-Health Literacy, serving as a moderating variable, involved indicators of information access, understanding, evaluation, and confidence in using digital health platforms (Brînzac et al., 2024). Lastly, Revisit Intention was measured by indicators such as repeat intention, facility comfort, past experience, and continuous commitment (Hasanah et al., 2024; Nguyen et al., 2021). Based on the formulated hypotheses and conceptual framework on Figure 1, this study employed using SmartPLS software to assess the significance and strength of relationships among constructs. Hypotheses were accepted if the obtained t-value was greater than 1.66 at a significance level of 5% ($\alpha = 0.05$), indicating a statistically significant relationship between the constructs (Ghozali, 2021)

The hypothesis of this study is as follows:

1. **H1,H3,H5,H7**: Service Quality dimensions positively affect Customer Perceived Value (CPV), including Function (H1), Emotion (H3), Social Influence (H5), and Trust (H7).
2. **H2, H4, H6, H8**: Service Quality dimensions positively affect Customer Satisfaction, including Function (H2), Emotion (H4), Social Influence (H6), and Trust (H8).
3. **H9**: E-Health Literacy positively affects Customer Satisfaction.
4. **H10-H11**: Customer Perceived Value (CPV) and Customer Satisfaction positively affect Revisit Intention.
5. **H12**: Customer Perceived Value positively affects Customer Satisfaction.

Table 2.
Operational Variables

Variable	Indicator	Code	Questionnaire Item
Service Quality (X) (Nguyen et al., 2021).	Hospital reputation	T1	I chose this hospital because it has a good reputation on social media.
	Staff honesty	T2	The medical staff provides honest information via the JKN Mobile application.
	Staff concern for patients	T3	The hospital staff helped me resolve digital registration issues.
	Doctor service	F1	The doctor provided good service to me.
	Receptionist service	F2	The receptionist helped me access digital services without any difficulty.
	Cleanliness	F3	I am satisfied with the cleanliness of the hospital, especially in the waiting room.
	Service schedule	F4	The service schedule shown in the app matches the actual practice.
	Post-service feeling	E1	I felt comfortable after using the hospital's digital services.
	Hospital effort	E2	The hospital strives to provide digital comfort for elderly patients.

	Patient recommendation	SI1	I received recommendations from other patients to use APM/JKN Mobile.
	Influence from other patients	SI2	Positive impressions from other patients influenced my trust in digital services.
Customer Perceived Value (M1) (Zang et al., 2022).	Quality of service	CPV1	I feel I receive high-quality service from the hospital's digital system.
	Patient effort	CPV2	I find it easy to register for the clinic using the JKN Mobile app and APM machine.
	Cost-benefit value	CPV3	The service fees shown digitally are appropriate for the quality received.
Customer Satisfaction (M2) (Anabir, 2023)	Overall satisfaction	CS1	I am satisfied with the ease of the hospital's digital services.
	Expectation fulfillment	CS2	The digital service meets my expectations as an elderly patient.
	Wise decision	CS3	Using this hospital's digital service is a wise decision.
E-Health Literacy (X2) (Norman & Skinner, 2006; Brînzac et al., 2024)	Information access	EHL1	I can access registration information via the JKN Mobile app.
	Understanding ability	EHL2	I understand digital instructions for making hospital reservations.
	Information evaluation	EHL3	I can distinguish between accurate and inaccurate information in online services.
	Confidence	EHL4	I am confident in operating the hospital's APM machine independently.
Revisit Intention (Y) (Yuniarti & Hidayat, 2021; Nguyen et al., 2021; Syah & Suyitno, 2025).	Revisit intention	RI1	I intend to return to this hospital because of its easy digital system.
	Facility comfort	RI2	I will choose this hospital again because its facilities are comfortable.
	Previous experience	RI3	I will choose this hospital again based on past experience.
	Previous healthcare experience	RI4	I will choose this hospital's healthcare services based on previous experience.
	Facility comparison	RI5	I continue visiting this hospital after comparing its registration facilities with others.
	Continued commitment	RI6	I will continue using the hospital's digital services in the future.

Source: Primary Data (2025), processed

RESULTS AND DISCUSSION

This chapter delineates the empirical findings of the research, beginning with a descriptive overview of the participant cohort and the core variables under scrutiny. Following this, a comprehensive exposition of the Partial Least Squares Structural Equation Modeling (PLS-SEM) analysis is provided. This encompasses a meticulous evaluation of the outer model, also known as the measurement model, to ascertain its reliability and validity,

and subsequently, an assessment of the inner model, or structural model, which includes the formal testing of the proposed hypotheses. The chapter culminates with an Importance-Performance Map Analysis (IPMA), designed to distill actionable insights pertinent to managerial decision-making within the healthcare context

Descriptive Analysis

Respondent demographics (shown in Table 1) indicated that the majority were female (60%), with the remaining 40% male. Regarding age distribution, most respondents fell within the range of 60–69 years (57%), followed by those aged 70–79 years (33%), respondents aged ≥80 years (9%), and only a minimal number below 60 years old (1%). In terms of educational background, respondents predominantly had primary school education or lower (30%), followed by senior high school graduates (28%) and junior high school graduates (25%). Those holding college or university degrees accounted for 14%, and respondents without formal education comprised only 3%. All respondents were beneficiaries of the national health insurance system (BPJS). The frequency of visits within the last six months was primarily between 3–6 times (67%), followed by respondents visiting once (10%), 2–3 times (9%), exactly 12 times (8%), and more than six times (6%).

Regarding the mode of arrival to the hospital, slightly more than half were accompanied by family members (51%), nearly half arrived independently (48%), and a marginal proportion (1%) used other means of arrival. This demographic summary provides an essential context for interpreting the study results, particularly concerning elderly patients' revisit intentions and their interactions with digital healthcare services.

SEM-PLS: Analysis Outer Model

Table 3.
Latent Variable Coefficient

Variables	Cronbach's Alpha	Composite Reliability (rho_a)	Composite Reliability (rho_c)	Average Variance Extracted (AVE)
Trust	0.844	0.865	0.905	0.76
Social Influence	0.9	0.904	0.952	0.909
Revisit Intention	0.938	0.944	0.951	0.764
Function	0.857	1.004	0.897	0.687
Emotion	0.841	0.854	0.926	0.862
E-Health Literacy	0.883	0.896	0.919	0.74
Customer Perceived Value	0.84	0.847	0.904	0.758
Customer Satisfaction	0.949	0.95	0.967	0.908

Source: Primary Data (2025), processed

Refer to Table 3 presents the reliability and validity indicators for each research construct. Cronbach's alpha values range from 0.840 to 0.949, exceeding the recommended threshold of 0.7, indicating excellent internal consistency. Composite reliability (rho_c) for all constructs is above 0.897, signifying robust construct reliability. Additionally, all AVE values surpass the acceptable threshold of 0.50, ranging from 0.687 to 0.909, confirming strong convergent validity among the indicators within each variable. Overall, these results

demonstrate that the measurement instruments utilized in this study are reliable and valid, thereby supporting further analysis and interpretation.

Table 4.
Outler Loadings Value Results

No	Variables	Item	Loading Factor	P Value
1	Trust	T1	0,852	<0.001
		T2	0,892	<0.001
		T3	0,871	<0.001
2	Emotion	E1	0,918	<0.001
		E2	0,939	<0.001
3	Function	F1	0,718	<0.001
		F2	0,881	<0.001
		F3	0,870	<0.001
		F4	0,837	<0.001
4	Social Influence	SI1	0,949	<0.001
		SI2	0,957	<0.001
5	Customer Perceived Value	CPV1	0,821	<0.001
		CPV2	0,907	<0.001
		CPV3	0,881	<0.001
6	Customer Satisfaction	CS1	0,944	<0.001
		CS2	0,959	<0.001
		CS3	0,955	<0.001
7	E-Health Literacy	EHL1	0,882	<0.001
		EHL2	0,883	<0.001
		EHL3	0,842	<0.001
		EHL4	0,831	<0.001
8	Revisit Intention	RI1	0,850	<0.001
		RI2	0,936	<0.001
		RI3	0,920	<0.001
		RI4	0,897	<0.001
		RI5	0,830	<0.001
		RI6	0,802	<0.001

Source: Primary Data (2025), Processed

The second test conducted in this study was to assess convergent validity. As shown in Table 4, all items across the eight measured constructs have loading factor values greater than 0.7, indicating that each indicator strongly correlates with its respective latent variable. In addition, the Average Variance Extracted (AVE) values for all constructs, as presented in Table 3, exceed the minimum threshold of 0.5. These results confirm that the constructs in this model meet the criteria for convergent validity, ensuring that the indicators effectively capture the underlying theoretical concepts they represent.

Table 5.
Cross Loadings Value Results

	CS	CPV	EHL	E	F	RI	SI	T
CPV1	0.533	**0.821**	0.540	0.659	0.351	0.372	0.697	0.328
CPV2	0.748	**0.907**	0.708	0.526	0.213	0.574	0.445	0.274

CPV3	0.728	**0.881**	0.699	0.384	0.233	0.530	0.319	0.275
CS1	**0.944**	0.748	0.743	0.559	0.208	0.650	0.457	0.227
CS2	**0.959**	0.738	0.790	0.532	0.157	0.576	0.417	0.188
CS3	**0.955**	0.725	0.826	0.556	0.161	0.636	0.408	0.145
E1	0.488	0.518	0.502	**0.918**	0.463	0.313	0.613	0.375
E2	0.577	0.588	0.550	**0.939**	0.319	0.406	0.750	0.234
EHL1	0.832	0.743	**0.882**	0.578	0.277	0.635	0.445	0.306
EHL2	0.700	0.561	**0.883**	0.430	0.160	0.569	0.289	0.169
EHL3	0.683	0.651	**0.842**	0.438	0.329	0.572	0.402	0.359
EHL4	0.591	0.600	**0.831**	0.498	0.297	0.559	0.326	0.255
F1	0.060	0.146	0.191	0.147	**0.718**	0.142	0.166	0.625
F2	0.229	0.358	0.343	0.460	**0.881**	0.303	0.411	0.627
F3	0.104	0.217	0.191	0.295	**0.870**	0.147	0.255	0.590
F4	0.136	0.170	0.221	0.347	**0.837**	0.199	0.288	0.545
RI1	0.655	0.602	0.713	0.513	0.270	**0.850**	0.325	0.223
RI2	0.566	0.446	0.599	0.338	0.217	**0.936**	0.251	0.198
RI3	0.559	0.449	0.574	0.271	0.222	**0.920**	0.229	0.220
RI4	0.511	0.433	0.510	0.249	0.229	**0.897**	0.233	0.195
RI5	0.454	0.398	0.447	0.255	0.189	**0.830**	0.203	0.117
RI6	0.615	0.593	0.653	0.357	0.226	**0.802**	0.341	0.229
SI1	0.420	0.495	0.396	0.714	0.323	0.299	**0.949**	0.303
SI2	0.434	0.557	0.422	0.695	0.380	0.291	**0.957**	0.376
T1	0.140	0.321	0.259	0.349	0.589	0.167	0.371	**0.852**
T2	0.232	0.307	0.285	0.255	0.600	0.250	0.264	**0.892**
T3	0.120	0.228	0.290	0.228	0.694	0.175	0.305	**0.871**

Source: Primary Data (2025), Processed

Table 6.
Fornell-Larcker Value Results

	CS	**CPV**	**EHL**	**E**	**F**	**RI**	**SI**	**T**
CS	**0.953**	0.773	0.826	0.577	0.184	0.652	0.448	0.196
CPV	0.773	**0.871**	0.748	0.598	0.301	0.570	0.554	0.334
EHL	0.826	0.748	**0.860**	0.568	0.307	0.681	0.430	0.318
E	0.577	0.598	0.568	**0.929**	0.415	0.390	0.739	0.322
F	0.184	0.301	0.307	0.415	**0.829**	0.262	0.370	0.712
RI	0.652	0.570	0.681	0.390	0.262	**0.874**	0.309	0.231
SI	0.448	0.554	0.430	0.739	0.370	0.309	**0.953**	0.358
T	0.196	0.334	0.318	0.322	0.712	0.231	0.358	**0.872**

Source: Primary Data (2025), Processed

Table 7.
HTMT Value Results

	CS	CPV	EHL	E	F	RI	SI	T
CS								
CPV	0.862							
EHL	0.889	0.859						
E	0.641	0.712	0.653					
F	0.175	0.318	0.327	0.447				
RI	0.679	0.623	0.730	0.422	0.260			
SI	0.485	0.642	0.475	0.844	0.379	0.329		
T	0.211	0.391	0.368	0.384	0.848	0.249	0.410	

Source: Primary Data (2025), Processed

The findings in Tables 5 (Cross Loadings), 6 (Fornell-Larcker), and 7 (HTMT) demonstrate that the measurement model exhibits acceptable discriminant validity. Table 5 shows that each indicator has the highest loading on its respective construct, indicating strong associations with its intended latent variable. For example, all Customer Satisfaction indicators (CS1–CS3) load highest within the CS column, while other constructs like Customer Perceived Value and E-Health Literacy also show strong loadings on their respective constructs, reinforcing the model's ability to distinguish between them. Table 6 confirms discriminant validity via the Fornell-Larcker criterion, as the square root of the AVE for each construct exceeds its correlations with other constructs. For instance, the Customer Satisfaction AVE is 0.953, surpassing correlations with Customer Perceived Value (0.773) and E-Health Literacy (0.826). Furthermore, Table 7s HTMT values are all below the 0.90 threshold, indicating empirical distinctiveness among constructs, with the highest HTMT value between Customer Satisfaction and E-Health Literacy at 0.889. Overall, these findings indicate that the measurement model satisfies discriminant validity criteria, establishing that each latent construct is statistically distinct and supporting the transition to structural model analysis

SEM-PLS: Analysis Inner Model

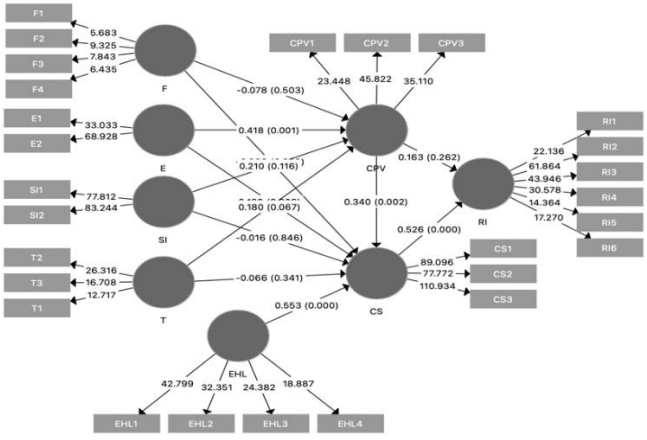

Figure 3.
Results of the Direct Effects Test between Latent Variables on Respondents at Hospital X

Source: Primary Data (2025), processed

The first step in the inner model assessment as illustrated by Figure 2 consists of checking for direct relationships between latent variables. Those in the results show certain relationships are both positive and significant, while others show little or no link. This analysis highlights which constructs truly influence outcomes like perceived worth, pleasure, and return desire.Specifically, Emotion has a significant and strong link to Customer Perceived Value: (β=0.418, p=0.001); Customer Satisfaction can be used to forecast have a good ratio of Revisit Intention (β=0.526, p=0.000). However, other dimensions such as Function and Trust, are lacking in power to explain. E-Health Literacy also plays a critical role by significantly enhancing Customer Satisfaction (β = 0.553, p = 0.000), highlighting the importance of digital capabilities among elderly patients. These results support several pathways in the model, particularly those related to emotional engagement and digital literacy.

Table 8.
Hypothesis Testing Summary

Hypothesis	Path	β	t-value	Result	f^2	Effect Size
H1	F → CPV	-0.078	0.666	Not Supported	0.010	No Effect
H2	F → CS	-0.089	1.293	Not Supported	0.015	No Effect
H3	E → CPV	0.418	3.351	Supported	0.125	Small Effect
H4	E → CS	0.129	1.278	Not Supported	0.024	Small Effect
H5	SI → CPV	0.210	1.581	Not Supported	0.032	Small Effect
H6	SI → CS	-0.016	0.183	Not Supported	0.000	No Effect
H7	T → CPV	0.180	1.879	Supported	0.026	Small Effect
H8	T → CS	-0.066	0.902	Not Supported	0.008	No Effect
H9	CPV → CS	0.553	0.340	Supported	0.176	Medium Effect
H10	CPV → RI	0.163	1.139	Not Supported	0.019	No Effect
H11	CS → RI	0.526	4.289	Supported	0.197	Medium Effect
H12	EHL → CS	0.553	6.913	Supported	0.511	Large Effect

Source: Primary Data (2025), processed

Hypothesis testing in the structural model using PLS-SEM evaluated the strength and significance of relationships among the latent constructs defined in the theoretical framework. The assessment utilized standardized path coefficients, t-statistics from bootstrapping with 5,000 subsamples, and p-values to determine statistical significance at the 5% level. A hypothesis is supported if the p-value is below 0.05 and the relationship direction aligns with theoretical predictions. Additionally, effect size (f^2) was included to evaluate the practical contribution of each exogenous construct to its target endogenous variable, following Cohen's (1988) thresholds: $f^2 < 0.02$ indicates no effect, 0.02–0.15 a small effect, 0.15–0.35 a medium effect, and > 0.35 a large effect.

As shown in Table 8, five hypotheses (H3, H7, H9, H11 and H12) were supported, indicating significant relationships consistent with theoretical expectations. For instance, E-Health Literacy's influence on Customer Satisfaction (H12) had a coefficient of 0.553 and an f^2 of 0.511, reflecting a strong contribution. Conversely, several hypotheses including H1, H2, H4, H5, H6, H8, and H10 were not supported ($p > 0.05$) and showed negligible effect sizes ($f^2 < 0.02$), indicating limited predictive value.

Importance-Performance Mapping Analysis (IPMA)

The next phase of the PLS-SEM analysis involves the advanced technique known as IPMA. This method is favored for its capacity to deliver more actionable and focused insights for managerial decision-making. In this study, Revisit Intention is identified as the key construct, as it represents the ultimate behavioral outcome that the model seeks to achieve. IPMA incorporates two dimensions: importance (total effect) and performance (perceived score), allowing for a combined visualization of the priority level of each construct and indicator. The importance score, derived from the total effect value, is displayed on the X-axis, ranging from 0 to 1, with negative values omitted from interpretation.

Performance, reflecting the average response value (rescaled from 0 to 100) based on the questionnaire items, is plotted along the Y-axis. By merging these two dimensions, IPMA enables the identification of high-impact, low-performance areas that should be prioritized for enhancement.

Table 9.
Importance-Performance Matrix (Abbreviated Constructs)

Construct	Importance (Total Effect)	Performance (%)
CS	0.526	61.12
CPV	0.342	67.68
EHL	0.291	58.50
E	0.210	61.44
F	–0.073 *(Ignored)*	74.27
SI	0.063	64.32
T	0.027	71.42
Avg.	0.198	65.53

Source: Primary Data (2025), processed

The IPMA analysis reveals that Customer Satisfaction (CS) is the most significant factor for revisit intention, with an importance score of 0.526 and a performance level of 61.12%. Improving CS should be a top priority. Customer Perceived Value (CPV) and E-Health Literacy (EHL) also matter, scoring 0.342 and 0.291, respectively, but EHL has the lowest performance at 58.50%, highlighting the need for better digital literacy among elderly patients. Emotion (E) has moderate importance at 0.210 and a performance level of 61.44%, making it a secondary priority. Function (F) has a negative effect of –0.073 and is excluded from analysis. Social Influence (SI) and Trust (T) show low importance scores of 0.063 and 0.027, respectively, indicating they require less managerial focus.

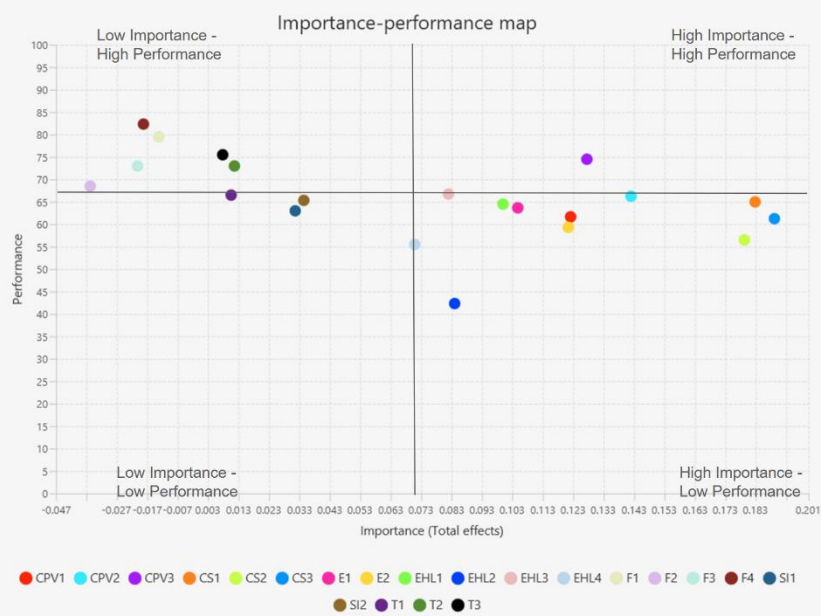

Figure 4.
The Importance-Performance Map
Source: Primary Data (2025), processed

The IPMA Map as shown in figure 4 highlights key areas for improving revisit intention. Indicators in the top-right quadrant (high importance – high performance), such as CS1, CS3, and CPV2, are current strengths that should be maintained. Conversely, indicators like EHL2 and EHL4 in the bottom-right quadrant (high importance low performance) present significant improvement opportunities. Enhancing digital understanding and confidence among elderly patients could notably boost satisfaction and loyalty.

Additionally, some items from the Function and Trust constructs (e.g., F1, F2, T1, T2) fall into the top-left quadrant (low importance – high performance). While they are performing well, their limited impact on revisit intention suggests they are not priority areas for resource allocation. Overall, the IPMA map provides clear guidance on which factors to strengthen and which to sustain.

Manager Implications

From a managerial standpoint, the findings offer insights for enhancing service strategies at Hospital X in West Jakarta. Elderly patients tend to be less receptive to digital healthcare services, negatively affecting their satisfaction. To address this, Hospital X should implement user-friendly manual registration services tailored for elderly patients, aiming to improve their comfort and satisfaction while reducing resistance to digital platforms. By aligning strategies with the needs of this demographic, the hospital can enhance satisfaction and encourage repeat visits from elderly patients.

CONCLUSION

Based on the hypothesis testing conducted in this study, the following key conclusions can be drawn:

1. Service-Quality Dimensions Driving Perceived Value: Emotional value (E) and Trust (T) significantly impact customer perceived value (CPV). Trust CPV, suggesting

hospitals should focus on building trust, user-friendly features, and social endorsements to enhance value perception among elderly users.

2. Determinants of Patient Satisfaction: E-health literacy is the strongest factor that significantly influences patient satisfaction, followed by CPV and trust. Meanwhile, the dimensions of functional value, social influence, and emotion do not significantly affect patient satisfaction. This shows that patient digital literacy and perceived value of services play a more important role than functional aspects of hospital digital services.
3. Value, Satisfaction, and Revisit Intention: Patient satisfaction (CS) was found to significantly influence the intention to revisit. Meanwhile, the direct influence of perceived value (CPV) on revisit intention is not significant. This suggests that in healthcare, even though patients perceive the service as high value, this is not sufficient to increase loyalty if it is not accompanied by satisfaction. Thus, enhancing perceived benefits and user experience is crucial for encouraging elderly patients to reuse services.
4. Role of e-Health Literacy (EHL): Higher e-health literacy predicts greater satisfaction, implying that hospitals should implement initiatives to improve seniors' digital skills. Empowering elderly users can enhance their satisfaction and effective use of e-health platforms.
5. Satisfaction and Loyalty: Customer satisfaction strongly boosts revisit intention, confirming that satisfied elderly patients are likely to continue using the service. Therefore, ensuring a high satisfaction level through reliable service and user-centered design is essential for fostering loyalty in digital healthcare.

These findings highlight the importance of trust-building and social factors in shaping perceived value and satisfaction for elderly patients, even more so than functional features. Improving e-health literacy is crucial for engaging older adults, and providers should focus on user education and a trustworthy design to enhance satisfaction and revisit intention.

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