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The Influence of Pharmaceutical Service Quality and Satisfaction on Patient Loyalty at RSKDIA Siti Fatimah and RSIA Paramount Makassar

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Abstract: Hospitals are an integral part of the health care system, where the pharmaceutical installation plays an important role in supporting service quality. Quality pharmaceutical services can improve patient satisfaction and loyalty. This study aims to analyze the effect of service quality on patient satisfaction and loyalty, and to see the mediating role of satisfaction in the relationship. The study was conducted quantitatively with the Structural Equation Modeling–Partial Least Square (SEM-PLS) approach using SmartPLS 4.0. The research locations were RSKDIA Siti Fatimah and RSIA Paramount Makassar, with a population of outpatients of the pharmaceutical installation in 2023. Data collection was carried out through questionnaires and interviews, with a sample of some patients from the total population. The results showed that service quality had a direct and significant effect on patient loyalty, with a greater contribution at RSIA Paramount. Service quality also affected patient satisfaction, and satisfaction had a significant role in mediating the relationship between service quality and loyalty. SERVQUAL dimensions such as reliability, responsiveness, assurance, empathy, and physical aspects are the main determining factors in creating satisfaction. The implementation of the patient-centered care approach has been proven to increase positive patient experiences. In conclusion, improving the quality of comprehensive pharmaceutical services is very important in shaping patient satisfaction and loyalty in hospitals, especially in primary care facilities.

Keywords: Service Quality, Patient Satisfaction, Patient Loyalty, Pharmacy Installation, SEM-PLS

1. INTRODUCTION

Hospitals are one of the health care facilities, according to UURI Regulation No. 44 of 2009 concerning hospitals, it states that hospitals are providers of comprehensive individual health services that provide outpatient, inpatient and emergency services. Along with the development of the technological era, hospitals have experienced the impact of these developments (Dash, 2020). Hospitals are an integral part of the entire health care system developed through a health development plan (Paramadani et al., 2020).

Align with research from Fadhilah et al. (2020), the pharmacy installation as one of the hospital service places is an inseparable part of the hospital health care system that is oriented towards patient care, providing quality drugs, including affordable clinical pharmacy services for all levels of society. Quality Hospital Pharmacy Installation services must be a concern for hospital leaders, because the Hospital Pharmacy Installation is a unit that has a large and very strategic influence in a hospital, it can be seen that the large contribution of the pharmaceutical sector in hospitals can reach 50% to 60% of the hospital budget. In addition, pharmaceutical services that refer to Pharmaceutical Care can be explained as a process of collaboration between pharmacists and patients and other professions in designing, implementing, and monitoring therapy plans that will produce specific therapy outcomes for patients (Morillo-Verdugo et al., 2022).

According to Hattingh et al. (2020), One important component whose availability influences the success of implementing health service efforts in hospitals is the pharmacy system. Pharmaceutical services are one of the activities in hospitals that support quality health services (Kassa et al., 221). This is clarified in the Minister of Health Regulation Number 72 of 2016 concerning Standards of Pharmaceutical Services in

Hospitals which states that hospital pharmaceutical services are an inseparable part of the hospital health service system that is oriented towards patient services, providing quality drugs, including clinical pharmacy services, which are affordable for all levels of society.

Setiono & Melinda (2022) said that, consumer satisfaction is defined as the response of customers or service users for each service provided. Consumer satisfaction or patient satisfaction can be said to be a benchmark for determining the quality of services provided by the Hospital or Hospital Pharmacy Installation. According to Nasirin & Lionardo (2020), If the patient satisfaction is good, it means that the service provided by the Hospital Pharmacy Installation is also very good. However, if the patient satisfaction is not good, it means that a special evaluation of the Hospital Pharmacy Installation service carried out by a particular Hospital is needed (Molla et al., 2022).

According to Silva & Fegadolli (2020), good pharmaceutical services are services that are directly oriented in the process of drug use, aiming to ensure the safety, effectiveness and rationality of drug use by applying science and function in patient care. The demands of patients and the community for the quality of pharmaceutical services require a change in the service paradigm from the old paradigm that is oriented towards products (Klimenkova et al., 2021).

Assessment of the quality of pharmaceutical services, one of which is done by knowing the level of patient satisfaction with the pharmaceutical services received so far, If the quality of pharmaceutical services received exceeds expectations, then the patient will compare the services experienced with the expected services. If the service felt does not match the expected service, then the patient is not satisfied and ultimately will not be loyal to the hospital (Nurhasma et al., 2021).

Patient loyalty not only increases the number of outpatient visits, but also increases commitment to patients to continue to utilize the health services provided and continue to visit the pharmacy depot of RSKDIA Siti Fatimah, South Sulawesi Province. Through this study, it is expected to find specific factors that cause a decrease in the number of outpatients, as well as how the quality of pharmaceutical services affects patient loyalty. This study will focus on aspects of service such as drug availability, waiting time, competence and attitude of health workers, and how improvements in these aspects can increase patient loyalty to the pharmacy installation of RSKDIA Siti Fatimah, South Sulawesi Province.

2. METHOD

This study uses a quantitative approach to test the relationship between variables through instruments such as questionnaires, with data analyzed statistically. The method used is Structural Equation Modeling (SEM) based on Partial Least Square (PLS) with the help of SmartPLS 4.0, because it is able to analyze direct and indirect relationships between latent variables (quality of pharmaceutical services, patient satisfaction, and patient loyalty) even though the data is not normal and the number of samples is limited. The study was conducted at RSKDIA Siti Fatimah and RSIA Paramount Makassar in 2024. The population includes outpatients of the pharmaceutical installation in 2023, totaling 632 and 1,400 patients, respectively. The sample is part of the population. The research variables consist of endogenous variables (patient loyalty) and exogenous variables (quality of service and patient satisfaction). Primary data were collected through interviews and questionnaires, while secondary data were obtained from related agencies and supporting literature. Data processing was carried out computerized through three stages: editing, coding, and tabulation. Data analysis used descriptive methods and SEM-PLS which included: model conceptualization, estimation algorithm, bootstrapping, evaluation of outer and inner models, and interpretation of results. Evaluation of the outer model for reflective constructs used loading factor, communality, and AVE indicators (>0.5), while for formative constructs, weight and multicollinearity significance tests were carried out with VIF <10 and tolerance>0.10.Reliability tests used Cronbach's Alpha and Composite Reliability with ideal values above 0.7.

Evaluation of the inner model included measuring the R^2 value to see the effect of exogenous variables on endogenous variables with the following interpretations: strong (0.75), moderate (0.50), and weak (0.25). The Q^2 value was used to measure the predictive relevance of the model with weak (0.02), moderate (0.15), and strong (0.35) interpretations. The evaluation also involved the significance value of the influence between variables through bootstrapping and blindfolding to produce the Q-square value. Hypothesis testing was carried out through bootstrapping with Path Coefficient measurements. The hypothesis is accepted if the t-statistic > 1.96 (alpha 5%) and p-value < 0.05. If the test results on the outer model are

significant, then the indicator is valid as a construct measurement tool. If the inner model is significant, it means that there is a real influence between latent variables. Data presentation is done descriptively in the form of frequency distribution tables and narratives which are continued with statistical tables of the influence test between independent and dependent variables. This study also pays attention to research ethics, such as respecting patients as respondents, providing freedom in participation, maintaining data confidentiality, and storing data as documentation after the study is completed.

3. FINDINGS AND DISCUSSIONS

Convergent Validity

Convergent validity is an indicator assessed based on the correlation between item score/component score and construct score, which can be seen from the standardized loading factor which describes the magnitude of the correlation of each measurement item (indicator) with the construct. An individual reflective measure is said to be high if it correlates more than 0.70 with the construct to be measured. According to Ghozali & Laten (2015) an outer loading value of 0.50-0.60 is still acceptable.

Outer Loading Test Results

Table 1. Outer Loading RSIA Paramount

	Patient Satisfaction (Y)	**Quality of Service (X)**	**Patient Loyalty (Dependent) (Z)**
KL.1		0.732	
KL.10		0.843	
KL.11		0.841	
KL.12		0.797	
KL.13		0.741	
KL.14		0.768	
KL.15		0.859	
KL.16		0.823	
KL.17		0.824	
KL.18		0.770	
KL.19		0.768	
KL.2		0.767	
KL.20		0.777	
KL.21		0.749	
KL.22		0.841	
KL.23		0.764	
KL.24		0.733	
KL.25		0.767	
KL.26		0.771	
KL.27		0.737	
KL.28		0.813	
KL.29		0.812	
KL.3		0.732	
KL.4		0.710	
KL.5		0.829	
KL.6		0.766	
KL.7		0.805	
KL.8		0.827	

KL.9		0.829	
KP.1	0.792		
KP.2	0.856		
KP.3	0.791		
KP.4	0.853		
KP.5	0.851		
KP.6	0.843		
KP.7	0.847		
KP.8	0.849		
KP.9	0.838		
LP.1			0.909
LP.10			0.933
LP.11			0.945
LP.12			0.916
LP.13			0.893
LP.14			0.896
LP.15			0.893
LP.2			0.886
LP.3			0.891
LP.4			0.883
LP.5			0.899
LP.6			0.911
LP.7			0.874
LP.8			0.870
LP.9			0.907

It can be seen that all data are above 0.7. So the assumption of convergent validity on all question items passes. The results of outer loading can also be seen in the following image:

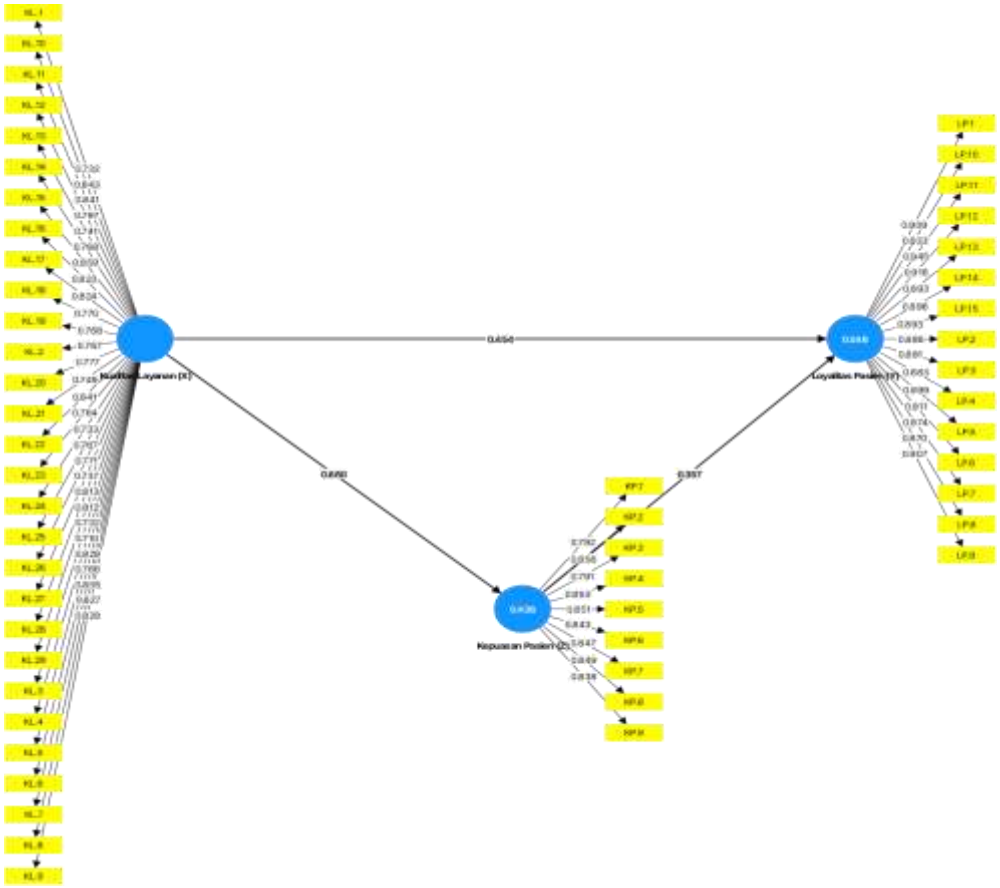

Figure 1. Outer Loading Analysis of RSIA Paramount, 2025

Table 2. Outer Loading of RSKDIA Siti Fatimah

	Patient Satisfaction (Z)	Quality of Service (X)	Patient Loyalty (Y)
KL.1		0.762	
KL.10		0.733	
KL.11		0.789	
KL.12		0.759	
KL.13		0.762	
KL.14		0.779	
KL.15		0.828	
KL.16		0.783	
KL.17		0.769	
KL.18		0.842	
KL.19		0.720	
KL.2		0.821	
KL.20		0.780	
KL.21		0.730	
KL.22		0.859	
KL.23		0.735	
KL.24		0.809	
KL.25		0.718	

KL.26		0.773	
KL.27		0.716	
KL.28		0.801	
KL.29		0.724	
KL.3		0.763	
KL.4		0.774	
KL.5		0.799	
KL.6		0.731	
KL.7		0.760	
KL.8		0.726	
KL.9		0.791	
KP.1	0.730		
KP.2	0.751		
KP.3	0.791		
KP.4	0.843		
KP.5	0.767		
KP.6	0.812		
KP.7	0.792		
KP.8	0.792		
KP.9	0.777		
LP.1			0.795
LP.10			0.838
LP.11			0.785
LP.12			0.777
LP.13			0.795
LP.14			0.785
LP.15			0.792
LP.2			0.805
LP.3			0.766
LP.4			0.817
LP.5			0.755
LP.6			0.798
LP.7			0.827
LP.8			0.763
LP.9			0.835

It can be seen that all data are above 0.7. So the assumption of convergent validity on all question items passes. The results of outer loading can also be seen in the following image:

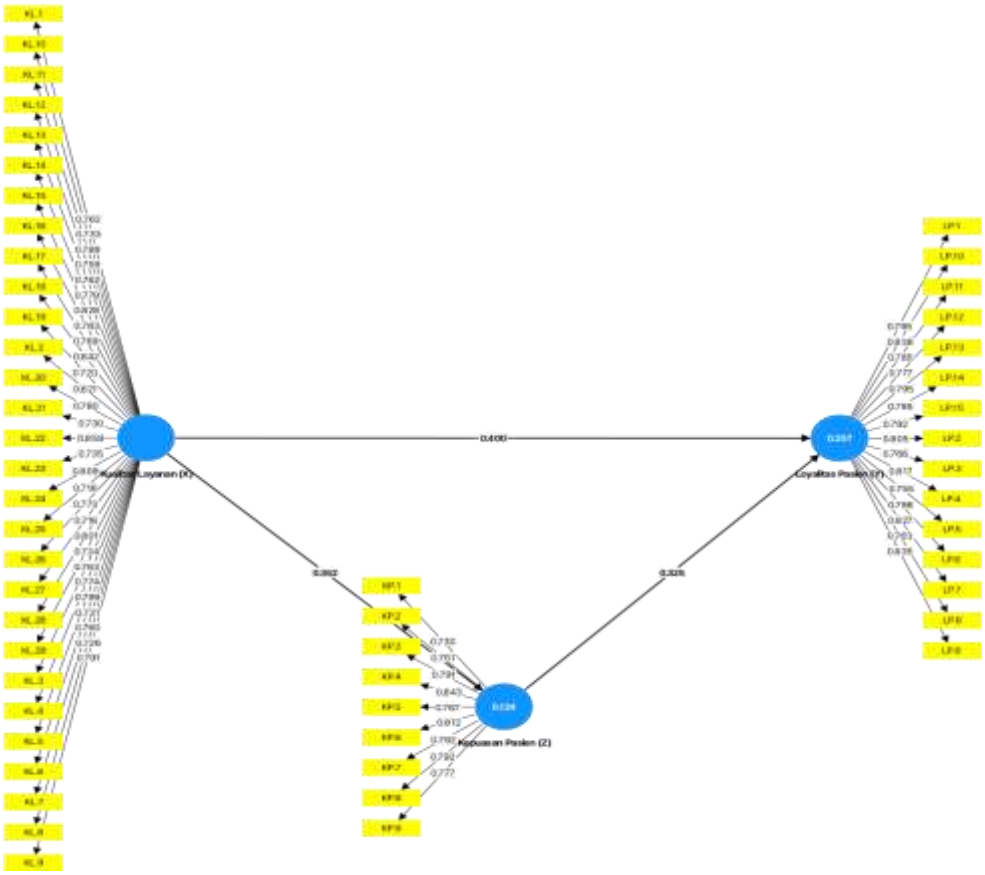

Figure 2. Outer Loading Analysis of RSKDIA Siti Fatimah, 2025

In addition to looking at the outer loading or loading factor value to evaluate convergent validity. Convergent validity can also be evaluated by considering the outer loading of the indicator and the average variance extracted (AVE). The model is said to have quite good convergent validity if the AVE (square of Average Variance Extracted) value is more than 0.50. This shows that on average the construct explains more than half of the variance of its indicators. As follows;

AVE Test Results

Table 3. AVE Test Results RSIA Paramount

	Cronbach's alpha	**Composite reliability (rho_a)**	**Composite reliability (rho_c)**	**Average variance extracted (AVE)**
Patient Satisfaction (Z)	0.946	0.947	0.954	0.698
Service Quality (X)	0.978	0.979	0.979	0.620
Patient Loyalty (Dependent) (Y)	0.983	0.984	0.985	0.811

Source: RSIA Paramount

Table 4. AVE Test Results RSKDIA Siti Fatimah

	Cronbach's alpha	**Composite reliability (rho_a)**	**Composite reliability (rho_c)**	**Average variance extracted (AVE)**
Patient Satisfaction (Z)	0.922	0.926	0.935	0.616

Service Quality (X)	0.976	0.978	0.977	0.595
Patient Loyalty (Y)	0.959	0.961	0.963	0.633

Source: RSKDIA Siti Fatimah

The Interpretation of AVE Value: (1) AVE value ≥ 0.5 indicates that the construct has good convergent validity. This means that at least 50% of the variance of the indicators can be explained by the construct being measured; (2) AVE value <0.5 indicates that convergent validity is low, so the indicators may not be good enough to represent the construct. It can be seen that all variables from the 2 Hospitals have values more than 0.5 so it can be said that convergent validity is acceptable.

Discriminant Validity

This testing stage is carried out to explain how far the difference between an indicator (manifest) of a construct with other constructs. In testing discriminant validity, there are 2 ways, namely by looking at the cross loading value or comparing the square root of the average variance extracted (AVE) for each construct with the correlation value between the construct and the model. This study uses cross loading and AVE values to determine the discriminant validity of an indicator. Cross loading is said to be better if the value of an indicator in a construct is higher than the other constructs. A good value is obtained if AVE> 0.50 for each construct. The following are the results of the discriminant validity test of each measuring instrument indicator:

Results of AVE Discriminant Validity Test for Each Indicator

Table 5. Results of AVE Discriminant Validity Test

	Patient Satisfaction (Y)	**Quality of Service (X)**	**Patient Loyalty (Dependent) (Z)**
KL.1	0.452	0.732	0.515
KL.10	0.621	0.843	0.589
KL.11	0.583	0.841	0.605
KL.12	0.542	0.797	0.549
KL.13	0.509	0.741	0.461
KL.14	0.421	0.768	0.494
KL.15	0.527	0.859	0.566
KL.16	0.566	0.823	0.545
KL.17	0.510	0.824	0.586
KL.18	0.472	0.770	0.542
KL.19	0.504	0.768	0.506
KL.2	0.394	0.767	0.500
KL.20	0.502	0.777	0.516
KL.21	0.520	0.749	0.488
KL.22	0.540	0.841	0.594
KL.23	0.496	0.764	0.548
KL.24	0.454	0.733	0.523
KL.25	0.568	0.767	0.561
KL.26	0.584	0.771	0.526
KL.27	0.477	0.737	0.502
KL.28	0.500	0.813	0.570
KL.29	0.589	0.812	0.594
KL.3	0.426	0.732	0.461
KL.4	0.454	0.710	0.476
KL.5	0.529	0.829	0.568

KL.6	0.572	0.766	0.561
KL.7	0.535	0.805	0.554
KL.8	0.553	0.827	0.604
KL.9	0.572	0.829	0.579
KP.1	0.792	0.489	0.512
KP.2	0.856	0.536	0.550
KP.3	0.791	0.495	0.552
KP.4	0.853	0.552	0.561
KP.5	0.851	0.553	0.551
KP.6	0.843	0.620	0.583
KP.7	0.847	0.593	0.541
KP.8	0.849	0.529	0.528
KP.9	0.838	0.583	0.557
LP.1	0.575	0.631	0.909
LP.10	0.600	0.634	0.933
LP.11	0.613	0.635	0.945
LP.12	0.594	0.637	0.916
LP.13	0.612	0.638	0.893
LP.14	0.604	0.647	0.896
LP.15	0.523	0.533	0.893
LP.2	0.566	0.637	0.886
LP.3	0.617	0.603	0.891
LP.4	0.580	0.604	0.883
LP.5	0.573	0.595	0.899
LP.6	0.612	0.622	0.911
LP.7	0.592	0.645	0.874
LP.8	0.584	0.623	0.870
LP.9	0.614	0.618	0.907

Source: RSIA Paramount

Based on the RS Paramount Cross Loading table above, it can be seen that the cross loading value of the indicators of each construct is greater than the other constructs, so it can be concluded that all indicators of each construct have met the discriminant validity criteria.

Table 6. Cross Loading RSKDIA Siti Fatimah

	Patient Satisfaction (Z)	**Quality of Service (X)**	**Patient Loyalty (Y)**
KL.1	0.332	0.762	0.444
KL.10	0.166	0.733	0.321
KL.11	0.203	0.789	0.391
KL.12	0.293	0.759	0.384
KL.13	0.279	0.762	0.407
KL.14	0.259	0.779	0.348

KL.15	0.255	0.828	0.413
KL.16	0.252	0.783	0.341
KL.17	0.197	0.769	0.323
KL.18	0.235	0.842	0.425
KL.19	0.244	0.720	0.342
KL.2	0.371	0.821	0.479
KL.20	0.333	0.780	0.397
KL.21	0.295	0.730	0.342
KL.22	0.289	0.859	0.440
KL.23	0.205	0.735	0.373
KL.24	0.351	0.809	0.509
KL.25	0.229	0.718	0.408
KL.26	0.357	0.773	0.479
KL.27	0.237	0.716	0.401
KL.28	0.272	0.801	0.398
KL.29	0.258	0.724	0.347
KL.3	0.280	0.763	0.351
KL.4	0.344	0.774	0.415
KL.5	0.256	0.799	0.405
KL.6	0.317	0.731	0.412
KL.7	0.209	0.760	0.307
KL.8	0.168	0.726	0.345
KL.9	0.198	0.791	0.386
KP.1	0.730	0.198	0.382
KP.2	0.751	0.210	0.405
KP.3	0.791	0.277	0.387
KP.4	0.843	0.351	0.431
KP.5	0.767	0.290	0.305
KP.6	0.812	0.266	0.283
KP.7	0.792	0.331	0.319
KP.8	0.792	0.263	0.282
KP.9	0.777	0.277	0.445
LP.1	0.394	0.371	0.795
LP.10	0.374	0.383	0.838
LP.11	0.253	0.401	0.785
LP.12	0.320	0.389	0.777
LP.13	0.283	0.402	0.795
LP.14	0.328	0.404	0.785
LP.15	0.301	0.362	0.792
LP.2	0.348	0.456	0.805
LP.3	0.348	0.389	0.766
LP.4	0.416	0.467	0.817
LP.5	0.418	0.387	0.755

LP.6	0.424	0.421	0.798
LP.7	0.429	0.454	0.827
LP.8	0.421	0.347	0.763
LP.9	0.442	0.471	0.835

Source: RSKDIA Siti Fatimah

Based on the Cross Loading table of RSKDIA Siti Fatimah above, it can be seen that the cross loading value of the indicators of each construct is greater than the other constructs, so it can be concluded that all indicators of each construct have met the discriminant validity criteria.

Discriminant Validity Test Results (Fornell Larcker Criterion)

Table 7. Results of Discriminant Validity Test RSIA Paramount

	Patient Satisfaction (Y)	**Quality of Service (X)**	**Patient Loyalty (Dependent) (Z)**
Patient Satisfaction (Z)	0.836		
Service Quality (X)	0.660	0.787	
Patient Loyalty (Dependent) (Y)	0.657	0.690	0.901

Source: RSIA Paramount

Table 8. Results of Discriminant Validity Test RSKDIA Siti Fatimah

	Patient Satisfaction (Z)	**Quality of Service (X)**	**Patient Loyalty (Y)**
Patient Satisfaction (Z)	0.785		
Service Quality (X)	0.352	0.771	
Patient Loyalty (Y)	0.466	0.514	0.796

Source: RSKDIA Siti Fatimah

Discriminant validity evaluation needs to be done by looking at the fornell and lacker criteria. Discriminant validity is a form of evaluation to ensure that variables are theoretically different and proven empirically/ statistical testing. The fornell and lacker criteria are that the root of the AVE variable is greater than the correlation between variables. for example, the Y value is 0.758, has a value that is greater than the lower ones, namely 0.753 and 0.736

Heterotrait-monotrait ratio (HTMT) Discriminant Validity Test Results

Table 9. Results of the Heterotrait-monotrait ratio (HTMT) Discriminant Validity Test RSIA Paramount

	Heterotrait-monotrait ratio (HTMT)
Service Quality (X) <-> Patient Satisfaction (Z)	0.681
Patient Loyalty (Dependent) (Y) <-> Patient Satisfaction (Z)	0.680
Patient Loyalty (Dependent) (Y) <-> Service Quality (X)	0.701

Source: RSIA Paramount

Table 10. Results of the Heterotrait-monotrait ratio (HTMT) Discriminant Validity Test RSKDIA Siti Fatimah

	Heterotrait-monotrait ratio (HTMT)
Service Quality (X) <-> Patient Satisfaction (Z)	0.359
Patient Loyalty (Dependent) (Y) <-> Patient Satisfaction (Z)	0.482
Patient Loyalty (Dependent) (Y) <-> Service Quality (X)	0.522

Source: RSKDIA Siti Fatimah

Hair et al (2019) recommend HTMT because this measure of discriminant validity is considered more sensitive or accurate in detecting discriminant validity. The recommended value is below 0.90. The test

results show that the HTMT value is below 0.90 for a pair of variables, so the discriminant validity is achieved. Variables divide the variation of measurement items into items that measure them more strongly than dividing the variance in other variable items. From the data above, it can be seen that all variables have HTMT values below 0.9

Reliability Test

In addition to the validity test, model measurement is also carried out to test the reliability of a construct. Testing is carried out to prove the accuracy, consistency and precision of the instrument in measuring the construct. The reliability test of a construct with reflective indicators can be carried out using two methods, namely composite reliability and Cronbach alpha. In this measurement, if the value achieved is greater than 0.70, the construct can be said to be reliable.

Table 11. Cronbach Alpha and Composite Reliability Values RSIA Paramount

	Cronbach's alpha	**Composite reliability (rho_a)**	**Composite reliability (rho_c)**	**Average variance extracted (AVE)**
Patient Satisfaction (Z)	0.946	0.947	0.954	0.698
Service Quality (X)	0.978	0.979	0.979	0.620
Patient Loyalty (Dependent) (Y)	0.983	0.984	0.985	0.811

Source: RSIA Paramount

Table 12. Cronbach Alpha and Composite Reliability Values RSKDIA Siti Fatimah

	Cronbach's alpha	**Composite reliability (rho_a)**	**Composite reliability (rho_c)**	**Average variance extracted (AVE)**
Patient Satisfaction (Z)	0.922	0.926	0.935	0.616
Service Quality (X)	0.976	0.978	0.977	0.595
Patient Loyalty (Y)	0.959	0.961	0.963	0.633

Source: RSKDIA Siti Fatimah

It can be seen from the Cronbach alpha and composite reliability values of the 2 hospitals above (Paramount and Siti Fatimah) which are greater than 0.7. So it can be said that all variables pass the reliability test.

Multicollinearity Test

The multicollinearity test in PLS-SEM (Partial Least Squares Structural Equation Modeling) aims to ensure that there is no very high correlation between the predictor variables (independent) used in the model. High multicollinearity can cause biased and unstable results, making it difficult to separate the influence of each predictor variable. In PLS-SEM, multicollinearity is tested by looking at the Variance Inflation Factor (VIF) of the predictor variables.

The criteria are: (1) If the VIF value of an independent variable is less than or equal to 10, it is considered that there is no serious multicollinearity. This means that the correlation between independent variables is still within acceptable limits, so that the influence of the independent variables can be separated well from other variables; (2) In practice, most researchers suggest a VIF below 5 for a safer margin, but a VIF ≤ 10 is still considered an acceptable limit in many studies.

Table 13. Multicollinearity Test Results RSIA Paramount

	Patient Satisfaction (Z)	**Quality of Service (X)**	**Patient Loyalty (Y)**
Patient Satisfaction (Z)			1.772
Service Quality (X)	1.000		1.772
Patient Loyalty (Y)			

Source: RSIA Paramount

Table 14. Multicollinearity Test Results RSKDIA Siti Fatimah

	Patient Satisfaction (Z)	**Quality of Service (X)**	**Patient Loyalty (Y)**
Patient Satisfaction (Z)			1.142
Service Quality (X)	1.000		1.142
Patient Loyalty (Y)			

Source: RSKDIA Siti Fatimah

From the results of the multicollinearity test, it can be concluded that all variables pass the multicollinearity test because they have values less than 5.

R Square Test

The Determination Coefficient (R Square or R Square) or symbolized by "R2" has the meaning as the contribution of the influence given by the influence of the independent variable (X) to the variable (Y). Or in other words, the value of the determination coefficient (Rsquare) is useful for predicting and seeing how much contribution the influence given by variable X simultaneously (Together) to variable Y.

Table 15. R Square Test RSIA Paramount

	R-square	**R-square adjusted**
Patient Satisfaction (Z)	0.436	0.434
Patient Loyalty (Y)	0.548	0.545

Source: RSIA Paramount

The R^2 value is: 0.75 (substantial/strong), 0.50 (moderate/moderate), 0.25 (weak/weak). Based on the results of the model analysis, it is known that the R-square value for the Patient Satisfaction variable (Z) is 0.436. This shows that 43.6% of the variation in patient satisfaction can be explained by the Service Quality variable in the model, while the remaining 56.4% is explained by other factors outside the research model. The Adjusted R-square value of 0.430 indicates an adjustment to the number of predictor variables and samples, and indicates that the model remains consistent although not very strong in explaining patient satisfaction.

Meanwhile, the R-square value for Patient Loyalty (Y) is 0.548, which means that 54.8% of the variation in patient loyalty can be explained by the Service Quality and Patient Satisfaction variables in the model. The Adjusted R-square value of 0.545 also shows the consistency and stability of the model, with a stronger influence than the first model. These results indicate that the independent variables in the study have a sufficient contribution in explaining patient loyalty, especially through the mediating role of satisfaction.

Table 16. R Square Test RSKDIA Siti Fatimah

	R-square	**R-square adjusted**
Patient Satisfaction (Z)	0.124	0.120
Patient Loyalty (Y)	0.357	0.352

Source: RSKDIA Siti Fatimah

Based on the results of the model analysis, it is known that the R-square value for the Patient Satisfaction variable (Z) is 0.124. This shows that 12.4% of the variation in patient satisfaction can be explained by the Service Quality variable in the model, while the remaining 87.6% is explained by other factors outside the research model. The Adjusted R-square value of 0.120 indicates an adjustment to the number of predictor variables and samples, and indicates that the model remains consistent although not very strong in explaining patient satisfaction.

Meanwhile, the R-square value for Patient Loyalty (Y) is 0.357, which means that 35.7% of the variation in patient loyalty can be explained by the Service Quality and Patient Satisfaction variables in the model. The Adjusted R-square value of 0.352 also shows the consistency and stability of the model, with a stronger influence than in the first model. These results indicate that the independent variables in the study have a

sufficient contribution in explaining patient loyalty, especially through the mediating role of satisfaction.

SRMR Test

SRMR is Standardized Root Mean Square Residual. In Yamin (2022), this value is a measure of model fit, namely the difference between the data correlation matrix and the estimated model correlation matrix. This test looks at the SRMR value if it is less than 0.10 then the model used is fit.

Table 17. SRMR test RSIA Paramount

	Saturated model	**Estimated model**
SRMR	0.038	0.038
d_ULS	2.076	2.076
d_G	2.184	2.184
Chi-square	3224.484	3224.484
NFI	0.833	0.833

Source: RSIA Paramount

It can be seen that the SRMR value is 0.038 < 0.10. So the model in this study is fit. And can be continued to the hypothesis test.

Table 18. SRMR test RSKDIA Siti Fatimah

	Saturated model	**Estimated model**
SRMR	0.056	0.056
d_ULS	4.555	4.555
d_G	2.563	2.563
Chi-square	3054.022	3054.022
NFI	0.753	0.753

Source: RSKDIA Siti Fatimah

It can be seen that the SRMR value is 0.056 <0.10. So the model in this study is fit. And can be continued to the hypothesis test.

F Square Test

The F-square (f^2) test in PLS-SEM (Partial Least Squares Structural Equation Modeling) is used to measure the local effect size or the effect of changes in the R^2 value when an independent variable is removed from the model. This helps identify how much influence the independent variable has on the dependent variable in the structural model.

The F-square (f^2) test shows the local effect size to see how much an independent variable contributes to the dependent variable in the structural model. Specifically, this test shows how much change in R^2 (coefficient of determination) occurs when one predictor variable is removed from the model. If the f^2 value is high, it means that the independent variable has a significant effect on the dependent variable. Conversely, a small f^2 value indicates that the variable has little influence. The f^2 results are interpreted based on the following criteria (Cohen, 1988): $f^2 \geq 0.02$: Small effect size, $f^2 \geq 0.15$: Medium effect size, $f^2 \geq 0.35$: Large effect size. The following are the results of the RSIA Paramount data analysis using the F-Square analysis.

Table 19. F Square Test RSIA Paramount

	Patient Satisfaction (Z)	**Quality of Service (X)**	**Patient Loyalty (Y)**
Patient Satisfaction (Z)			0.159
Service Quality (X)	0.772		0.257
Patient Loyalty (Dependent) (Y)			

Source: RSIA Paramount

Based on the results of the effect size analysis (f-square), it is known that the influence of Service Quality on Patient Satisfaction has an f^2 value of 0.772, which according to Cohen's guidelines is included in the

large effect category. This shows that Service Quality makes a very strong contribution in explaining the variation in Patient Satisfaction in this research model.

Meanwhile, the influence of Patient Satisfaction on Patient Loyalty has an f^2 value of 0.159, which is in the medium effect category. This shows that Patient Satisfaction has a fairly important role in shaping Patient Loyalty, although its influence is not as large as the direct influence of service quality on satisfaction.

Meanwhile, the direct influence of Service Quality on Patient Loyalty has an f^2 value of 0.257, which is also included in the medium effect category, but is stronger than the effect of Patient Satisfaction on Patient Loyalty. Thus, it can be concluded that in this model, Service Quality is the dominant factor that influences both Patient Satisfaction and Loyalty, both directly and through mediation effects. The following are the results of the RSKDIA Siti Fatimah data analysis using the F-Square analysis.

Table 20. F Square Test RSKDIA Siti Fatimah

	Patient Satisfaction (Z)	**Quality of Service (X)**	**Patient Loyalty (Y)**
Patient Satisfaction (Z)			0.144
Service Quality (X)	0.142		0.218
Patient Loyalty (Y)			

Source: RSKDIA Siti Fatimah

Based on the results of the effect size analysis (f-square), it was obtained that the f^2 value of Service Quality on Patient Satisfaction was 0.142, which according to Cohen's guidelines is included in the medium effect category. This means that service quality has a significant influence in explaining patient satisfaction. Furthermore, the influence of Patient Satisfaction on Patient Loyalty has an f^2 value of 0.144, which is also included in the medium effect category. This shows that patient satisfaction makes a relevant contribution to the formation of patient loyalty.

In addition, the direct influence of Service Quality on Patient Loyalty has an f^2 value of 0.218, which is still in the medium effect category, but is greater than the satisfaction effect. This shows that service quality has an important role, both directly and indirectly through patient satisfaction, in forming patient loyalty. Overall, all relationships tested in the model have a medium effect, meaning that these variables substantially contribute to the relationship in the structural model.

Goodness of Fit Test

The Goodness of Fit Test aims to test the overall suitability of the model, both for the outer model and the inner model and whether there is a match between the observed values and the expected values in the model.

Table 21. Goodness of Fit Test RSIA Paramount

	Saturated model	**Estimated model**
SRMR	0.038	0.038
d_ULS	2.076	2.076
d_G	2.184	2.184
Chi-square	3224.484	3224.484
NFI	0.833	0.833

Source: RSIA Paramount

According to Wetzels et al (2009) in Yamin (2022), the interpretation of the GoF index value is 0.1 (low GoF), 0.25 (medium GoF) and 0.36 (high GoF). The calculation results show that the GoF value of the model is 0.833 in the NFI table and is included in the high GoF category. Empirical data is able to explain the measurement model and the measurement model with a high level of fit.

Table 22. Goodness of Fit Test RSKDIA Siti Fatimah

	Saturated model	**Estimated model**
SRMR	0.056	0.056

d_ULS	4.555	4.555
d_G	2.563	2.563
Chi-square	3054.022	3054.022
NFI	0.753	0.753

Source: RSKDIA Siti Fatimah

According to Wetzels et al (2009) in Yamin (2022), the interpretation of the GoF index value is 0.1 (low GoF), 0.25 (medium GoF) and 0.36 (high GoF). The calculation results show that the GoF value of the model is 0.753 in the NFI table and is included in the high GoF category. Empirical data is able to explain the measurement model and the measurement model with a high level of fit.

Q2 Test

The Q^2 measurement is tested using blindfolding testing and a model can be said to meet the predictive relevance criteria if the coefficient of Q^2 is higher than 0. A Q^2 value greater than 0 indicates that the model has predictive relevance for a particular endogenous construct, conversely a value of 0 and below indicates a lack of predictive relevance (Hair et al., 2017:207). The level measurement, the relative size of predictive relevance, namely a value of 0.02; 0.15; and 0.35 indicates that the independent variable construct has small, medium, or large predictive relevance for a particular dependent variable construct.

Table 23. Q2 Test RSIA Paramount

	SSO	**SSE**	**Q^2 (=1-SSE/SSO)**
Patient Satisfaction (Z)	2799.000	1974.064	0.295
Service Quality (X)	9019.000	9019.000	0.000
Patient Loyalty (Dependent) (Y)	4665.000	2641.127	0.434

Source: RSIA Paramount

The results of the PLS-SEM analysis produce a Q2 value greater than 0, then it can be classified as a large predictive relevance in constructs Z and Y, meaning that variable X has great relevance in predicting variables Z and Y.

Table 24. Q2 Test RSKDIA Siti Fatimah

	SSO	**SSE**	**Q^2 (=1-SSE/SSO)**
Patient Satisfaction (Z)	2205.000	2044.775	0.073
Service Quality (X)	7105.000	7105.000	0.000
Patient Loyalty (Y)	3675.000	2881.023	0.216

Source: RSKDIA Siti Fatimah

The results of the PLS-SEM analysis produced a Q2 value greater than 0, then it can be classified as a large predictive relevance in constructs Z and Y, meaning that variable X has great relevance in predicting variables Z and Y.

Inner Hypothesis Analysis

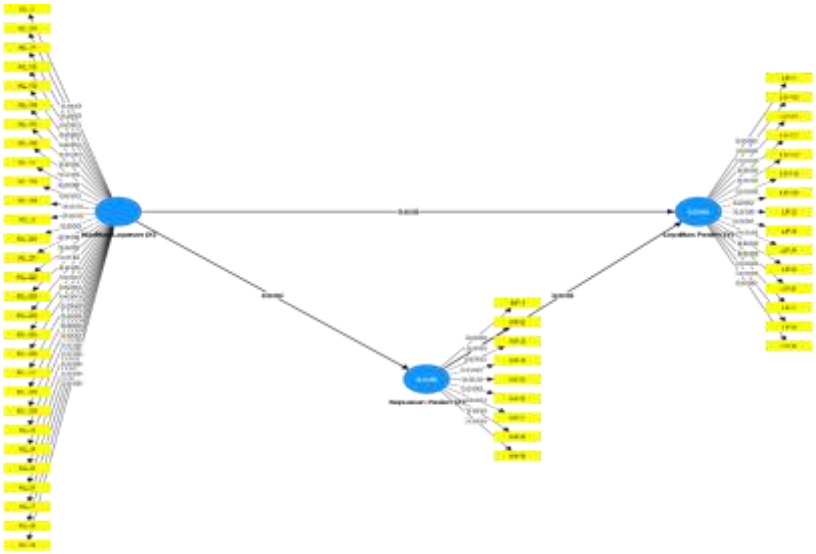

Figure 3. Inner Hypothesis Analysis of RSIA Paramount, 2025

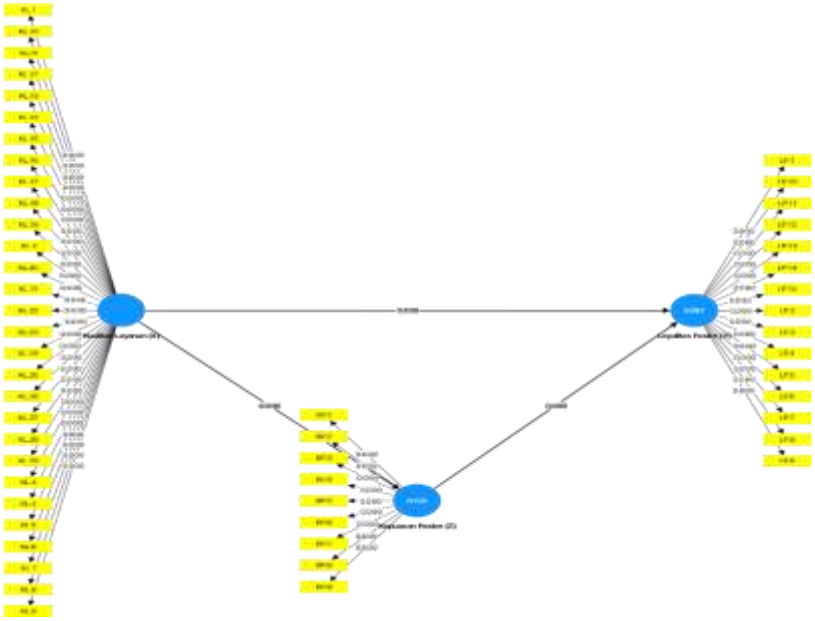

Figure 4. Inner Hypothesis Analysis of RSKDIA Siti Fatimah, 2025

Direct Influence

Hypothesis testing in multiple regression tests using t-tests and p-values is one of the research hypothesis tests in simple linear regression analysis models or multiple linear regression. This t-test is used to determine whether the independent variable (X) partially (alone) affects the dependent variable (Y). The basis for decision making in the t-test is as follows: (1) If the significance value (sig.) <0.05 and t count> t table, then there is a significant influence of variable X on Y; (2) If the significance value (sig.) > 0.05 and t count <t table, then there is no significant influence of variable X on Y. The following is a path analysis of RSIA Paramount and RSKDIA Siti Fatimah.

Table 25. SEM PLS Data Processing of Paramount Hospital

	Original sample (O)	**Sample mean (M)**	**Standard deviation (STDEV)**	**T statistics (|O/STDEV|)**	**P values**

Patient Satisfaction (Z) -> Patient Loyalty (Y)	0.357	0.353	0.059	6.001	0.000
Service Quality (X) -> Patient Satisfaction (Z)	0.660	0.654	0.064	10.354	0.000
Service Quality (X) -> Patient Loyalty (Y)	0.454	0.452	0.072	6.352	0.000

The results of the path analysis - path coefficients show that all relationships between variables in the model are positive and statistically significant. The path from Patient Satisfaction (Z) to Patient Loyalty (Y) has a coefficient value of 0.357, with a t-statistic of 6.001 and a p-value of 0.000. This shows that Patient Satisfaction has a positive and significant effect on Patient Loyalty, so that the higher the satisfaction felt by the patient, the higher the level of loyalty formed. Furthermore, the path from Service Quality (X) to Patient Satisfaction (Z) shows a coefficient value of 0.660, with a t-statistic of 10.354 and a p-value of 0.000. This value is the highest among all relationships, indicating that Service Quality has a significant effect on Patient Satisfaction, and its contribution is very strong in forming the perception of satisfaction.

The path from Service Quality (X) to Patient Loyalty (Y) is also significant, with a coefficient value of 0.454, t-statistic 6.352, and p-value 0.000. This means that Service Quality not only has an impact on patient satisfaction, but also directly affects patient loyalty. Thus, all paths in this model are proven to be significant at the 5% level ($p < 0.05$) and indicate a positive relationship direction. This finding supports the hypothesis that Service Quality is the main factor that affects Patient Loyalty, both directly and through the mediation of Patient Satisfaction.

Table 26. SEM PLS Data Processing of Siti Fatimah DIA Hospital

	Original sample (O)	**Sample mean (M)**	**Standard deviation (STDEV)**	**T statistics (|O/STDEV|)**	**P values**
Patient Satisfaction (Z) -> Patient Loyalty (Y)	0.325	0.331	0.068	4.807	0.000
Service Quality (X) -> Patient Satisfaction (Z)	0.352	0.357	0.084	4.199	0.000
Service Quality (X) -> Patient Loyalty (Y)	0.400	0.394	0.096	4.168	0.000

The results of the path analysis - path coefficients show that all relationship paths between variables in the structural model are significant and positive. The path of Patient Satisfaction (Z) to Patient Loyalty (Y) shows a coefficient value of 0.325 with a t-statistic of 4.807 and a p-value of 0.000. Because $p < 0.05$, this relationship is declared significant. This means that the higher the satisfaction felt by the patient, the higher the level of loyalty formed.

Furthermore, the path from Service Quality (X) to Patient Satisfaction (Z) shows a coefficient value of 0.352, with a t-statistic of 4.199 and a p-value of 0.000. This shows that service quality has a positive and significant direct effect on the level of patient satisfaction.

The direct path from Service Quality (X) to Patient Loyalty (Y) shows the highest coefficient, which is 0.400, with a t-statistic of 4.168 and a p-value of 0.000. This shows that service quality not only plays a role in increasing patient satisfaction, but also has a direct and significant effect on the formation of patient loyalty. Thus, it can be concluded that in this model, Service Quality plays a dual role, namely providing a direct influence on loyalty and also indirectly through mediation of patient satisfaction. All paths in the model are statistically valid and support the proposed hypothesis.

Indirect Influence

Table 27. Results of Specific Indirect Effects Analysis of RSIA Paramount

	Original sample (O)	**Sample mean (M)**	**Standard deviation (STDEV)**	**T statistics (|O/STDEV|)**	**P values**

Service Quality (X) -> Patient Satisfaction (Z) -> Patient Loyalty (Y)	0.236	0.231	0.046	5.130	0.000

The results of the specific indirect effects analysis show that there is a significant indirect effect of the Service Quality variable on Patient Loyalty through Patient Satisfaction. The coefficient value of the mediation path is 0.236, with a t-statistic of 5.130 and a p-value of 0.000, which means it is significant at the 5% level ($p < 0.05$). These results indicate that Patient Satisfaction acts as a strong mediator in bridging the effect of Service Quality on Patient Loyalty. Thus, Service Quality not only has a direct effect on Patient Loyalty, but also has an indirect effect through increasing Patient Satisfaction. This mediation effect strengthens the position of Patient Satisfaction as an important intermediary variable in strengthening loyalty. The better the quality of service perceived, the higher the satisfaction that arises, and ultimately will have an impact on increasing patient loyalty.

Table 28. Results of Specific Indirect Effects Analysis of RSKDIA Siti Fatimah

	Original sample (O)	**Sample mean (M)**	**Standard deviation (STDEV)**	**T statistics (|O/STDEV|)**	**P values**
Service Quality (X) -> Patient Satisfaction (Z) -> Patient Loyalty (Y)	0.115	0.117	0.036	3.213	0.001

The results of the specific indirect effects analysis show that there is a significant indirect effect of the Service Quality variable (X) on Patient Loyalty (Y) through Patient Satisfaction (Z). The coefficient value of the mediation path is 0.115, with a t-statistic of 3.213 and a p-value of 0.001, which means it is significant at the 5% level ($p < 0.05$). This indicates that Patient Satisfaction statistically acts as a mediator that strengthens the effect of Service Quality on Patient Loyalty. Thus, this model proves that Service Quality affects Patient Loyalty not only directly, but also indirectly through increased Patient Satisfaction. This mediation effect confirms that satisfaction is a key variable in building loyalty, which arises as a result of positive experiences with the services received by patients.

Discussion

The Influence of Service Quality on Loyalty

The results of the study showed that service quality has a positive and significant effect on patient loyalty, with a coefficient of 0.690, t-statistic 9.784, and p-value 0.000. Important dimensions that shape loyalty include responsiveness, reliability, assurance, and physical aspects (tangible). Fast response to complaints, consistent and accurate service, a sense of security in treatment, and clean and tidy physical facilities increase positive patient perceptions. High service quality also reduces the likelihood of patients switching to other services, and encourages long-term loyalty accompanied by constructive feedback, creating a mutually reinforcing relationship between quality and loyalty (Shie et al., 2022).

The Effect of Patient Satisfaction on Loyalty

Based on the results of the hypothesis test in this study, it was found that patient satisfaction has a positive and significant effect on patient loyalty with a coefficient value of 0.384, t-statistic 5.767, and p-value 0.000. This shows that the higher the level of satisfaction felt by patients, the more likely patients are to remain loyal to the health center services. Satisfied patients tend to be free promotional agents for health centers. They not only come back for treatment but also bring family members, even suggest to their community to choose the same service. Thus, it can be concluded that patient satisfaction is not just an end goal, but an ongoing process that requires continuous strategy, evaluation, and innovation. Patient loyalty as the end result of this process is the main indicator of the success of health service management. Health centers that want to maintain patient loyalty must place satisfaction as the main indicator in the planning and evaluation of service programs (Bezerra et al., 2022). Thus, the development of a patient-based service system is an absolute must to achieve long-term goals in primary health care.

The Influence of Service Quality on Patient Satisfaction

This study shows that service quality has a significant effect on patient satisfaction, with a coefficient value of 0.395, t-statistic of 5.874, and p-value of 0.000. The main dimensions of service quality based on the SERVQUAL model include reliability, responsiveness, assurance, empathy, and physical facilities. Reliability in diagnosis and accuracy of service, as well as a clean and comfortable environment, have been shown to increase patient satisfaction. Patient-centered care is key to creating a positive experience. Satisfied patients are more cooperative, comply with medical advice, and support the sustainability of health services at the health center.

The Effect of Service Quality on Loyalty Through Patient Satisfaction

Service quality is a key factor in shaping patient loyalty, both directly and through satisfaction as a mediating variable. This study shows that good service quality will result in satisfaction, which in turn drives patient loyalty. This relationship is statistically significant, confirming that loyalty is not only formed from technical service standards, but also from the patient's subjective experience. The patient-centered care approach, which emphasizes empathy, communication, and patient involvement, has been shown to increase satisfaction and loyalty (Çakmak & Uğurluoğlu, 2024). Therefore, quality improvement must cover technical and non-technical aspects comprehensively. The managerial implication is that health center managers need to focus on key service points that affect satisfaction to optimize patient loyalty.

4. CONCLUSION

Service quality has a direct effect on patient loyalty. At RSIA Paramount, the effect is 0.454, while at RSKDIA Siti Fatimah it is 0.400. This shows that the quality of pharmaceutical services is very important in forming loyalty, even without the mediation of satisfaction. Patient satisfaction has a significant effect on patient loyalty in both hospitals. The coefficient of influence at RSIA Paramount is 0.357, while at RSKDIA Siti Fatimah it is 0.325. This means that the higher the satisfaction felt by the patient, the more likely the patient will be loyal to the hospital. Service quality has a positive and significant effect on patient satisfaction at both RSKDIA Siti Fatimah and RSIA Paramount. At RSIA Paramount, the coefficient of influence is 0.660, much higher than at RSKDIA Siti Fatimah with a coefficient of 0.352. This shows that the perception of the quality of pharmaceutical services at RSIA Paramount is more capable of significantly increasing patient satisfaction. The indirect effect (mediation) of service quality on loyalty through patient satisfaction is also significant. At RSIA Paramount, the mediation value reached 0.236, while at RSKDIA Siti Fatimah it was only 0.115. This shows that patient satisfaction has a role as an important mediator, but its strength is greater at RSIA Paramount.

Suggestion

Hospitals, especially RSKDIA Siti Fatimah and RSIA Paramount Makassar, are expected to continue to improve the quality of pharmaceutical services. Hospitals need to emphasize aspects of speed of service, accuracy of drug information, friendliness of pharmacists, and efficiency of the drug collection process as part of efforts to improve the quality of service. In addition, it is important for hospital management to build a more systematic patient feedback system in order to monitor satisfaction levels periodically and conduct data-based evaluations of the performance of pharmaceutical service units. Further research is expected to develop the research model by adding other variables that can also affect patient loyalty, such as medical services, nursing, hospital administration, and the comfort of physical facilities. This aims to make the analysis of the relationship between variables more comprehensive and reflect the overall condition of hospital services. The use of a qualitative approach or mixed methods can also be an alternative to explore patient perceptions and experiences in more depth.

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