Jornal Development Manecos

ISSN: 2988-5957
Vol. 4 No. 1, 2026
Page: 170-194

The Effect of Drug Availability and Patient Satisfaction on User Loyalty of Pharmacy Services at Rsd Dr. H. Soemarno Sosroadmodjo Tanjung Selor

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Article Info

Article History:

Received May 18, 2026
Revised June 15, 2026
Accepted: July 2, 2026

Keywords:

Drug Availability, Patient Satisfaction, Patient Loyalty, Pharmacy Services, Hospital.

Abstract

Hospital pharmacy services play a strategic role in ensuring therapeutic success, patient safety, and building public trust in the quality of healthcare services. Optimal drug availability and patient satisfaction are important factors assumed to influence the loyalty of pharmacy service users, especially in regional hospitals facing logistical and distribution challenges. This study aimed to analyze the effect of drug availability on patient loyalty, the effect of patient satisfaction on patient loyalty, and the simultaneous effect of both variables among pharmacy service users at RSD dr. H. Soemarno Sosroadmodjo Tanjung Selor. This study employed a quantitative approach with an explanatory survey design. Data were collected through structured questionnaires distributed to 100 patient respondents who used pharmacy services and were selected using purposive sampling. The data were analyzed using multiple linear regression. The results showed that drug availability had a positive and significant effect on patient loyalty. Patient satisfaction also has a positive and significant effect on patient loyalty. Simultaneously, both variables significantly affected patient loyalty, with a coefficient of determination of 57.4%. This means that 57.4% of patient loyalty could be explained by drug availability and patient satisfaction, while the remaining proportion was influenced by other factors outside the research model. Patient satisfaction was proven to be the most dominant factor in improving loyalty. These findings confirm that improving patient loyalty depends not only on drug availability but also on the quality-of-service experiences perceived by patients. Therefore, hospitals need to strengthen drug inventory management and continuously improve the quality of pharmacy services to create patient satisfaction and loyalty. Future studies are recommended to expand research locations to various hospitals and apply mixed methods approaches to obtain more comprehensive insights.

Introduction

Pharmaceutical services play a fundamental role in the modern healthcare system, as optimal drug availability is a key factor in successful therapy and patient safety. In Indonesia, the implementation of pharmaceutical services in hospitals is guided by Minister of Health Regulation No. 72 of 2016, which requires the availability of appropriate types of drugs, the right quantities, and prompt delivery to ensure quality service. Despite this regulation, the reality of drug provision in many healthcare facilities indicates that the expected standards are still not fully met, particularly in areas outside Java that face geographical and distribution challenges. Various national reports also demonstrate unequal access and logistical management barriers, leading to procurement delays and a high risk of stockouts. This situation indicates that drug demand planning and supply mechanisms have not been fully integrated effectively between the central and regional governments. Therefore, improving the drug supply chain management system is a strategic priority to enhance the quality of

DOI: https://doi.org/10.71435/738357

pharmaceutical services in hospitals. Over the past five years, national drug availability has exhibited a pattern of sharp fluctuations in line with the dynamics of global and domestic challenges. Ministry of Health data indicates that the availability of essential medicines in healthcare facilities was around 80–85% during the 2019–2023 period, with a significant decline in 2020–2021 due to disruptions to the international supply chain during the pandemic (Shi et al., 2023; Yenet et al., 2023; Fanda et al., 2024). This decline reflects that drug availability issues are not merely technical but also structural and systemic in hospital pharmacy management. Supply instability directly impacts patient satisfaction, as medicines are a key component in the healing process and the continuity of therapy. When medicines are unavailable in hospitals, patients are forced to purchase them outside the facility, increasing costs and time, and reducing trust in the quality of care. This situation ultimately impacts patient perceptions and loyalty as healthcare users, which are important indicators of successful pharmaceutical services.

At the national level, a report by the Indonesian Social Security Agency confirmed that patient complaints regarding drug availability remained among the top five complaints regarding hospital services throughout 2022–2023 (Prasetiyo & Rahayu, 2025; Fatimah et al., 2025). These facts indicate that delays in procurement and drug shortages remain a serious issue that has not been fully resolved. Many patients report that drug unavailability and long waiting times are the main factors contributing to dissatisfaction with hospital pharmacy services. This situation illustrates that pharmaceutical services depend not only on administrative and distribution processes, but also on effective coordination between related units such as the pharmacy installation, procurement department, and suppliers. This situation strongly suggests that improvements to the supply chain management system and drug demand planning need to be more structured and based on calculations of actual needs. Efforts to improve the quality of pharmaceutical services should be directed at strengthening the drug logistics information system, which can predict demand and preventing stockouts.

This phenomenon of patient complaints is further reinforced by research findings that reveal that medication availability is the most dominant factor in determining patient satisfaction with pharmacy services, compared to other variables such as waiting room comfort or staff friendliness (Eftekhari et al., 2023; Mostafapour et al., 2024; Hennrich et al., 2024). These findings demonstrate that the core of pharmaceutical services lies in the ability of healthcare facilities to provide medications appropriately and consistently. If medications are not available when needed, all other well-designed service aspects become less meaningful to patients. This emphasizes that the success of pharmaceutical services depends on the effectiveness of the medication management system, from planning and procurement to storage and distribution. Therefore, healthcare facilities are required to improve forecasting accuracy, evaluate medication usage patterns, and partner with providers to ensure availability. This approach is a key strategy for increasing patient trust and satisfaction as healthcare users.

Within the framework of healthcare quality, medication availability is an "input" element in the Donabedian model (structure-process-outcome). When input components are not optimally met, the service process will experience disruptions, directly impacting the effectiveness and efficiency of pharmaceutical services (Balakrishnan, 2025). Insufficient input, such as medications, can lead to delays in therapy, decreased accuracy of medical treatment, and increased risk of service errors. As a result, patient satisfaction and loyalty are impacted because the service experience does not meet expectations (Brandão & Ribeiro, 2023; Chen et al., 2024; Rao et al., 2025). Donabedian's model explains that service quality must be viewed as an interconnected whole, where the success of the output depends heavily on the completeness of the structural components and the smoothness of the process. Therefore, the

DOI: https://doi.org/10.71435/738357

issue of drug availability cannot be separated from the overall evaluation of health service quality, as it is the primary foundation for providing safe and quality services.

Furthermore, Indonesia remains highly dependent on imported raw materials for pharmaceuticals, reaching up to 90%, making the national pharmaceutical system highly vulnerable to external disruptions such as global pandemics, trade wars, or fluctuations in the rupiah exchange rate. This high dependence often leads to delays in drug production and distribution, creating supply uncertainty in healthcare facilities. This situation demonstrates that the stability of drug availability is a strategic issue requiring more comprehensive and sustainable policy intervention. This issue further reinforces the urgency of implementing a more responsive logistics monitoring system based on real-time data, so healthcare facilities can anticipate potential stockouts.

Systematic evaluation of the impact of medication availability on patient experience and loyalty is essential as a basis for formulating strategies to improve service quality (AlOmari & Hamid, 2022; Wulandari et al., 2024). This is crucial to ensure pharmaceutical services focus not only on operational aspects but also on meeting patient needs and satisfaction, indicators of successful healthcare services. North Kalimantan, as a new province, still faces significant challenges in the distribution of healthcare logistics, including medicines, a vital component of medical services. Geographical factors such as the vast area, transportation dependent on rivers and sea routes, and limited land access make drug distribution challenging. The lack of supporting infrastructure, such as standardized storage facilities and an integrated regional distribution system, also slows down the supply flow. This situation makes drug supplies at regional hospitals more susceptible to delays than in regions with more established distribution systems. This situation impacts the instability of drug availability at referral healthcare facilities, especially for those with high and urgent needs. Therefore, increasing healthcare logistics capacity is a top priority that the local government and relevant stakeholders must work on.

Dr. H. Soemarno Sosroadmodjo Regional General Hospital (RSD) Tanjung Selor, as the main hospital in Bulungan Regency, bears a significant responsibility in providing quality pharmaceutical services to the community. As a referral hospital, this healthcare facility serves as a center for medical care for a vast and geographically diverse region. However, patient complaints about medication unavailability, delays in pharmaceutical services, and the need for patients to seek medication outside the hospital are still frequently found, according to internal reports and satisfaction surveys. This situation indicates that medication availability issues impact not only operational aspects but also patient trust and experience with service quality. This situation indicates the need for a comprehensive evaluation of the hospital's drug needs planning, procurement, and stock management systems. Therefore, efforts to improve pharmaceutical services are a crucial part of the strategy to improve the overall quality of healthcare services in Bulungan Regency. Based on prescription and essential drug fulfillment data for the 2020–2024 period, there is a consistent improvement in the performance of the Hospital Pharmacy Unit in ensuring the availability and service of medicines to patients.

In 2020, the prescription and essential drug fulfillment rate remained at 90%, reflecting limitations in the drug planning and procurement system. This situation began to improve in 2021, with prescription fulfillment increasing to 92% and essential drug fulfillment reaching 93%, in line with strengthening pharmacy management and formulary optimization. Significant improvements occurred in 2022, marked by the achievement of 100% prescription fulfillment and 97% essential drug fulfillment. These achievements indicate that the drug management system has been running more effectively, particularly in the aspects of planning,

DOI: https://doi.org/10.71435/738357

procurement, and stock control. This positive trend was maintained in 2023 and 2024, with prescription fulfillment remaining at 100% and essential drug fulfillment stable at 97%. Overall, this data illustrates continuous improvement in pharmaceutical service performance, which is a crucial foundation for efforts to improve the quality of healthcare in hospitals. Patient satisfaction levels for the 2020–2024 period show an increasing trend, despite some fluctuations. In 2020, patient satisfaction was recorded at 71.08%, indicating that service quality remained satisfactory but needed improvement. This improvement occurred in 2021, reaching 75.26%, in line with efforts to improve service processes and enhance the performance of pharmacy staff. In 2022, the satisfaction level decreased slightly to 73.27%, indicating that aspects of the service still require ongoing evaluation. This situation improved again in 2023, with the satisfaction level increasing to 74.37% through strengthening service standards and quality monitoring. The peak achievement occurred in 2024, with the satisfaction level reaching 78.2%, reflecting the success of various efforts to improve the quality of pharmaceutical services.

This trend indicates that improved pharmaceutical service performance positively contributes to patient perceptions and satisfaction as healthcare users (Al Zaidan et al., 2022). In an era of increasingly dynamic healthcare competition, patient loyalty is a strategic indicator in maintaining public trust in healthcare facilities. Patient loyalty is reflected not only through repeat visits but also through recommendations to family, colleagues, and the community, a form of word of mouth that significantly impacts the service's reputation. In the context of modern hospital management, loyalty is a crucial asset because it determines operational sustainability, stable visitation numbers, and institutional competitiveness. Therefore, understanding the determinants of loyalty, including medication availability, quality of pharmaceutical services, and patient satisfaction, is crucial for in-depth research. When patients feel their therapeutic needs are well met, trust in the hospital increases and has the potential to foster long-term relationships.

Therefore, medication availability is not only a technical pharmaceutical issue but also a strategic aspect in building loyalty and a positive hospital image. In the context of Dr. H. Soemarno Sosroadmodjo Regional General Hospital (RSD) in Tanjung Selor, the issue of patient loyalty is becoming increasingly important as the level of competition in healthcare services in the region continues to increase. The presence of private healthcare facilities with faster, more modern, and more efficient service approaches, particularly in the pharmaceutical process, poses a real challenge for public hospitals. When patients experience more satisfactory pharmaceutical services elsewhere, they are likely to switch services and not return to RSD as their primary choice. This situation can threaten the hospital's position as a referral center and erode public trust in the services provided. If issues of drug availability and waiting times are not addressed systematically, the risk of losing patient loyalty will increase. Therefore, improving the quality of pharmaceutical services is a strategic step to ensure RSD's competitiveness and the sustainability of healthcare services in Bulungan Regency.

Research by Tadesse et al. (2023) concluded that drug availability, pharmacist counseling, and the quality of pharmaceutical services significantly influence patient satisfaction and loyalty. These findings confirm that pharmaceutical services are a multidimensional construct involving interactions between technical, clinical, and interpersonal aspects. Medication availability is the primary foundation, while education and therapeutic communication from pharmacists are crucial elements in strengthening patients' understanding of their therapy. The study explained that when patients receive comprehensive services and an accurate medication distribution system, their perception of service quality improves significantly. The satisfaction formed through this positive experience develops into ongoing patient loyalty. Therefore,

DOI: https://doi.org/10.71435/738357

improving the quality of pharmaceutical services must be carried out comprehensively, considering every component involved in the patient care process. Herawati et al. (2023) found that medication availability had a direct and strong influence on patient satisfaction and loyalty in the Pharmacy Unit of Hospital X, Bekasi City. These study results reinforce the role of medication availability as a dominant factor in shaping a satisfying pharmaceutical service experience. When medications are fully available and easily obtained, patients feel comfortable and secure in undergoing treatment. Conversely, when stockouts occur, trust in the hospital decreases because patients feel their therapeutic needs are not prioritized. This study also emphasizes that the quality of pharmaceutical services is measured not only by the speed of service but also by the hospital's ability to ensure continuity of therapy. Therefore, drug availability is a key indicator that must be maintained to increase the competitiveness of pharmaceutical services and maintain patient loyalty. Molla et al. (2022) demonstrated that the availability of essential medications has a strong positive correlation with outpatient satisfaction in hospitals. These findings confirm that medication availability is a key element in the perception of service quality, as patients assess the effectiveness of services based on the hospital's ability to meet their therapeutic needs in a timely manner. When medications are fully available, satisfaction levels increase significantly, especially in cases of chronic diseases that require continuous treatment. This situation demonstrates that medication availability is not merely a logistical issue but also concerns patient trust and comfort in receiving medical care.

Another study by Carter et al. (2023) also showed that overall pharmaceutical services, including medication availability, influence patient loyalty. This study emphasized that loyalty results from a series of consistent and repeated service experiences, not just a single, fleeting interaction. Patients who feel well-served are more likely to return to services and recommend the hospital to others, thereby strengthening the hospital's competitive position. These findings emphasize that effective pharmaceutical service management is a crucial strategy for maintaining the sustainability of healthcare services.

Research by Wulandari et al. (2025) found that several service factors, such as medication availability, waiting times, and clear delivery of medication information, significantly influence outpatient satisfaction. These findings suggest that patient satisfaction is determined not only by medication availability but also by the quality of interactions and communication between pharmacists and patients. Efficient waiting times and accurate medication information can improve patient perceptions of hospital professionalism. This study provides empirical evidence in the context of a general hospital, thus serving as a reference for improving pharmaceutical service management. These results also emphasize the importance of integrating pharmaceutical information systems to ensure patients receive prompt and appropriate care.

Therefore, holistic pharmaceutical care plays a crucial role in building long-term patient satisfaction. Although previous research has explored the relationship between medication availability, satisfaction, and loyalty, most of it was conducted on the island of Java, leaving limited research examining hospital conditions in North Kalimantan. This region faces distinct geographic and logistical challenges, including drug distribution to remote areas and limited transportation. These infrastructure limitations can impact consistent medication availability and patient wait times. Therefore, research in North Kalimantan is crucial to provide a concrete picture of effective pharmaceutical service strategies in a region with unique conditions. Such contextual research can also help formulate hospital policies that are more adaptive to local needs. Therefore, further research in this region is crucial for understanding the dynamics of patient satisfaction and loyalty more comprehensively. Furthermore, previous research has

DOI: https://doi.org/10.71435/738357

been predominantly conducted on private or public hospitals in urban areas, so studies examining type C hospitals in rural areas, such as Dr. H. Soemarno Sosroadmodjo Regional General Hospital, are rare. Type C hospitals in non-urban areas present unique challenges, including limited pharmacists, medication storage facilities, and medication distribution to service units. These conditions have the potential to impact medication availability and the overall patient experience. The lack of studies in this context has limited understanding of strategies to improve patient satisfaction and loyalty in regional hospitals. Research targeting type B hospitals in regional areas could provide specific insights into effective pharmaceutical service management interventions. Therefore, this type of contextual research is crucial to support service quality improvement in non-urban areas.

Another limitation of research on hospital pharmacy services is the limited number of studies that comprehensively examine the relationship between medication availability, patient satisfaction, and patient loyalty. Most previous studies tend to view medication availability as a factor directly influencing patient loyalty without considering how the patient's service experience shapes their level of satisfaction, which ultimately influences their decision to return to the same hospital. From a consumer behavior perspective, patient satisfaction is the result of an evaluation of the service experience received during the healthcare process. Therefore, if the service provided meets patient expectations, satisfaction levels will increase and can foster a positive attitude toward the healthcare facility. In the context of hospital pharmacy services, medication availability is an important indicator of service quality because the availability of complete and easily accessible medications can help patients obtain optimal treatment, thus providing a better service experience.

However, there is still limited research examining the relationship between drug availability, patient satisfaction, and patient loyalty within a comprehensive analytical framework, particularly in regional hospital pharmacy services. Therefore, research at Dr. H. Soemarno Sosroadmodjo Regional Hospital is crucial in providing an empirical overview of the relationship between drug availability, patient satisfaction, and patient loyalty. This can serve as a basis for efforts to improve the quality of pharmaceutical services that are oriented towards patient satisfaction and sustainable use of services. Previous research has also not deeply linked drug availability to the logistics management system in regional hospitals, particularly regarding stock-outs and drug supply chain management in areas with limited transportation access.

These limitations often lead to delays in drug deliveries, shortages in hospital pharmacies, and ultimately impact patient satisfaction. An effective logistics management system is crucial to ensuring the consistent availability of essential drugs, particularly in Type C hospitals operating in remote areas. This phenomenon requires a comprehensive analysis to understand how stock management and distribution influence patient perceptions of pharmaceutical services. Therefore, the relationship between drug availability and logistics management is an important focus that has not been widely discussed in previous literature. Research that highlights this aspect will help hospitals design operational strategies that are more efficient and responsive to patient needs.

Based on these facts, research on the relationship between drug availability, patient satisfaction, and user loyalty in pharmaceutical services at Dr. H. Soemarno Sosroadmodjo Regional General Hospital, Tanjung Selor, is crucial. Hospitals need strong empirical data as a basis for improving drug logistics management and enhancing the overall quality of pharmaceutical services. This research is expected to contribute scientifically to the growing body of literature on medication management, pharmaceutical services, and patient behavior in the context of

DOI: https://doi.org/10.71435/738357

remote hospitals. Beyond academic contributions, the research findings can also serve as a reference for policymakers in formulating evidence-based service quality improvement strategies. Quantitative analysis of patient satisfaction and loyalty will provide an objective overview of the effectiveness of pharmaceutical services. Therefore, this research plays a crucial role in supporting the development of adaptive and sustainable regional health policies.

Therefore, this research is highly urgent given its significant impact on the sustainability of hospital pharmacy services, increasing patient satisfaction, and strengthening community loyalty to regional health services. Guaranteed medication availability and responsive pharmaceutical services are key factors in building patient trust and minimizing the risk of dissatisfaction. Furthermore, this research can help identify operational and logistical barriers that impact service quality, enabling hospital management to formulate targeted improvement strategies. A comprehensive analysis will also provide insight into the relationship between patient experience, satisfaction, and long-term loyalty. Therefore, this research is not only locally relevant but also provides empirical contributions that can be applied to the context of pharmacy management in regional type C hospitals. An emphasis on quantitative evidence and best practices will strengthen the policy basis for health services in remote areas.

Method

Research Design

This study employed a quantitative approach using an explanatory survey design to examine the causal relationships among research variables. A quantitative approach was considered appropriate because the study aimed to measure the influence of drug availability and patient satisfaction on patient loyalty through numerical data and statistical analysis. Explanatory research seeks to explain the causal relationships among variables and test hypotheses derived from theoretical frameworks. The study adopted a cross-sectional survey design, whereby data were collected from respondents at a single point in time. This design allows for the systematic examination of the relationships between variables and provides empirical evidence regarding factors influencing patient loyalty in hospital pharmacy services.

Research Location and Time

The study was conducted at Dr. H. Soemarno Sosroadmodjo Regional General Hospital (RSD) located in Tanjung Selor, Bulungan Regency, North Kalimantan Province, Indonesia. The hospital was selected because it serves as the primary referral healthcare facility in the region and provides pharmaceutical services to a large number of patients. Data collection was carried out between March and April 2025. This period was considered adequate to obtain representative responses from pharmacy service users and to ensure the availability of relevant operational data required for the study.

Population and Sample

The population of this study consisted of all outpatients who received pharmacy services at Dr. H. Soemarno Sosroadmodjo Regional General Hospital during the study period. Outpatients were selected as the target population because they represent the largest group of pharmacy service users and directly experience the processes related to medication availability, dispensing services, and service quality. The inclusion criteria included patients who received prescription medications from the hospital pharmacy, were at least 17 years old, were capable of understanding and responding to the questionnaire, and were willing to participate in the study. Patients who were unable to complete the questionnaire independently or declined participation were excluded from the study. Considering the large and dynamic number of

DOI: https://doi.org/10.71435/738357

outpatient visits, it was not feasible to survey the entire population. Therefore, a sample was selected using a probability sampling technique with a simple random sampling approach. This method ensured that every eligible patient had an equal opportunity to be selected as a respondent, thereby reducing selection bias and increasing the representativeness of the sample. The sample size was determined using the Slovin formula with a margin of error of 10 percent, which is commonly used in social and health research when the population size is large and relatively homogeneous.

Research Variables and Operational Definitions

This study consisted of two independent variables and one dependent variable. The first independent variable was drug availability, which refers to the extent to which prescribed medications are available and accessible to patients through the hospital pharmacy. This variable was measured through indicators including the completeness of prescribed medications, availability of essential medicines, timeliness of medication provision, frequency of stock-outs, and ease of obtaining medications without having to purchase them outside the hospital.

The second independent variable was patient satisfaction, defined as the patients' overall evaluation of the pharmaceutical services received. Patient satisfaction was measured using dimensions adapted from the SERVQUAL model, including reliability, responsiveness, assurance, empathy, and tangibles. The dependent variable was patient loyalty, which refers to the patient's commitment to continue utilizing pharmacy services provided by the hospital. Loyalty was assessed through indicators such as intention to revisit, willingness to recommend the hospital to others, preference for the hospital pharmacy over alternative providers, and commitment to continue using the service despite the availability of alternatives.

Data Collection Instrument

Primary data were collected using a structured questionnaire designed based on relevant theories and previous empirical studies related to healthcare service quality, patient satisfaction, and patient loyalty. The questionnaire consisted of closed-ended statements measured using a five-point Likert scale ranging from strongly disagree to strongly agree. The instrument was developed based on the Donabedian healthcare quality framework, the SERVQUAL model, and theories concerning patient loyalty in healthcare services. The use of a Likert scale enabled the transformation of respondents' perceptions and experiences into quantitative data suitable for statistical analysis.

Data collection was conducted after respondents completed the pharmaceutical service process and received their prescribed medications. Before completing the questionnaire, respondents were informed about the purpose of the study and assured that their responses would remain confidential and be used solely for research purposes. Participation was entirely voluntary, and informed consent was obtained from each respondent prior to data collection.

Validity and Reliability Testing

Prior to conducting the main analysis, the research instrument was subjected to validity and reliability testing to ensure its accuracy and consistency. Validity testing was performed using the Pearson Product-Moment correlation method by examining the relationship between individual item scores and the total score of each construct. An item was considered valid if the calculated correlation coefficient exceeded the critical value of the correlation table at a significance level of 0.05. Reliability testing was conducted using Cronbach's Alpha coefficient to evaluate the internal consistency of the questionnaire items. A construct was

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considered reliable when the Cronbach's Alpha value was equal to or greater than 0.70. The validity and reliability tests ensured that the questionnaire accurately measured the intended variables and produced consistent results across respondents.

Data Analysis Technique

The collected data were analyzed using IBM SPSS Statistics software. The analysis process began with descriptive statistical analysis to provide an overview of respondent characteristics and describe the distribution of responses for each research variable. Descriptive statistics included frequency distributions, percentages, means, standard deviations, minimum values, and maximum values. These statistics provided a comprehensive understanding of respondent perceptions regarding drug availability, patient satisfaction, and patient loyalty.

Before conducting regression analysis, classical assumption tests were performed to ensure that the data met the requirements of multiple linear regression analysis. These tests included normality testing using the Kolmogorov–Smirnov test, multicollinearity testing using Variance Inflation Factor (VIF) and tolerance values, heteroscedasticity testing using scatterplot analysis and the Glejser test, and linearity testing to confirm the existence of linear relationships between independent and dependent variables. Compliance with these assumptions ensured the validity and reliability of the regression results.

After all assumptions were satisfied, multiple linear regression analysis was employed to examine the influence of drug availability and patient satisfaction on patient loyalty. The regression model used in this study was expressed as $Y = \alpha + \beta1X1 + \beta2X2 + e$, where Y represents patient loyalty, α represents the constant, β1 and β2 represent regression coefficients, X1 represents drug availability, X2 represents patient satisfaction, and e represents the error term.

Hypothesis Testing

Hypothesis testing was conducted using the t-test, F-test, and coefficient of determination (R^2). The t-test was used to examine the partial effect of each independent variable on patient loyalty. A significance value below 0.05 indicated that the independent variable had a statistically significant effect on the dependent variable. The F-test was used to evaluate the simultaneous effect of drug availability and patient satisfaction on patient loyalty. A significance value below 0.05 indicated that the regression model was statistically significant and capable of explaining variations in patient loyalty.

Furthermore, the coefficient of determination (R^2) was calculated to assess the extent to which variations in patient loyalty could be explained by the independent variables included in the model. Higher R^2 values indicate stronger explanatory power of the regression model and demonstrate the contribution of drug availability and patient satisfaction in influencing patient loyalty among pharmacy service users.

Result and Discussion

Despite extensive research examining drug availability, patient satisfaction, and patient loyalty, limited empirical evidence has investigated these relationships simultaneously within the context of regional hospitals located in geographically challenging areas such as North Kalimantan. Previous studies have primarily focused on hospitals in urban regions with relatively well-established pharmaceutical logistics systems, leaving insufficient understanding of how drug availability and patient satisfaction jointly influence patient loyalty in remote healthcare settings. Furthermore, few studies have integrated structural aspects of pharmaceutical services, particularly drug availability, with patients' service experiences to

DOI: https://doi.org/10.71435/738357

explain loyalty in a comprehensive framework. Addressing this gap, the present study investigates the effects of drug availability and patient satisfaction on patient loyalty among pharmacy service users at Dr. H. Soemarno Sosroadmodjo Regional General Hospital, Tanjung Selor. The findings are expected to contribute to the literature on hospital pharmaceutical service management while providing practical evidence to support strategies for improving pharmaceutical service quality, strengthening patient loyalty, and enhancing healthcare delivery in regional hospitals with unique logistical and geographical challenges.

Table 1. Results of the Drug Availability Validity Test

Statement Item	Calculated r-value (r count)	r-table (n = 100, α = 0.05)	Remark
The medication I received at the hospital pharmacy installation was in accordance with the prescription provided by the doctor.	0.848	0.196	Valid
The medication I needed was prepared and provided by the pharmacy staff promptly.	0.833	0.196	Valid
The availability of medication in this hospital was consistently maintained throughout my treatment period.	0.796	0.196	Valid
I was able to obtain all prescribed medications without having to purchase them outside the hospital.	0.848	0.196	Valid

Based on the validity test results using Pearson correlation between each statement item and the total score of the Drug Availability variable, all items had a high and significant correlation. The items "The medication I received at the hospital pharmacy was in accordance with the doctor's prescription" had a correlation of 0.848, "The medication I needed was prepared and administered by the pharmacist promptly" had a correlation of 0.833, "The availability of medication at this hospital was consistently maintained throughout my service" had a correlation of 0.796, and "I was able to obtain all prescribed medication without having to purchase medication outside the hospital" had a correlation of 0.848 with the total score of the variable. All significance values showed $p < 0.001$ ($p < 0.05$). This indicates that each statement item has a strong and directional relationship with the drug availability variable construct. Furthermore, all calculated r values were greater than the table r (0.196) for a sample size (n = 100), thus all items were declared valid. The strength of the correlation which is in the strong category indicates that the instrument used can measure the drug availability variable consistently and accurately.

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Table 2. Patient Satisfaction Validity Test Results

Variable / Dimension	Statement Item	Calculated r-value (r count)	r-table (n = 100, α = 0.05)	Remark
Patient Satisfaction – Reliability (Medication Service Reliability)	Pharmacy staff provide medication according to the doctor's prescription without errors.	0.782	0.196	Valid
Patient Satisfaction – Reliability (Medication Service Reliability)	Medication services at the hospital pharmacy installation are consistently reliable.	0.736	0.196	Valid
Patient Satisfaction – Responsiveness (Service Responsiveness and Speed)	Pharmacy staff serve me promptly.	0.784	0.196	Valid
Patient Satisfaction – Responsiveness (Service Responsiveness and Speed)	The waiting time for medication collection at the hospital pharmacy installation is relatively short.	0.215	0.196	Valid
Patient Satisfaction – Assurance (Guarantee and Competence of Pharmacy Staff)	Pharmacy staff appear competent and professional.	0.785	0.196	Valid
Patient Satisfaction – Assurance (Guarantee and Competence of Pharmacy Staff)	Pharmacy staff provide clear explanations regarding medication rules and usage instructions.	0.761	0.196	Valid
Patient Satisfaction – Empathy (Care and Concern of Staff)	Pharmacy staff provide friendly and polite service.	0.829	0.196	Valid
Patient Satisfaction – Empathy (Care and Concern of Staff)	Pharmacy staff provide sufficient attention to patients' needs and complaints.	0.786	0.196	Valid
Patient Satisfaction – Tangibles (Physical Evidence and Facility Comfort)	The pharmacy waiting room is clean and comfortable.	0.733	0.196	Valid
Patient Satisfaction – Tangibles (Physical Evidence and Facility Comfort)	Supporting facilities in the pharmacy installation (waiting room, seating, information boards) are adequate.	0.777	0.196	Valid

Source: Processed data, 2026

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Based on the validity test results for the Patient Satisfaction variable, a Pearson Product Moment correlation was conducted between each statement item and the total score of the variable. The analysis showed that all items had a high and significant correlation coefficient. The correlation values for each indicator against the total score were: Pharmacists dispensed medication according to the doctor's prescription without error = 0.782, Medication service at this hospital's pharmacy is consistently reliable = 0.736, Pharmacists served me quickly = 0.784, Waiting time for medication pickup at this hospital's pharmacy is relatively short = 0.215, Pharmacists appeared competent and professional = 0.785, Pharmacists provided clear explanations regarding the rules and instructions for medication use. = 0.761, Pharmacy staff provide friendly and polite service = 0.829, Pharmacy staff pay sufficient attention to patient needs and complaints = 0.786, Pharmacy waiting room is clean and comfortable = 0.733, and Supporting facilities in the pharmacy installation (waiting room, seating, information boards) are adequate = 0.777. All significance values show Sig. (2-tailed) < 0.001, which means the relationship between each item and the total score of the variable is statistically significant. In addition, all calculated r values are greater than the table r (0.196) for the sample size (n = 100), so all items are declared valid, all indicators used can measure the patient satisfaction construct accurately and are suitable for further analysis.

Table 3. Patient Loyalty Validity Test Results

Statement Item	Calculated r-value (r count)	r-table (n = 100, α = 0.05)	Remark
I intend to return to use the pharmacy services of this hospital.	0.844	0.196	Valid
I would recommend this hospital to others.	0.834	0.196	Valid
I prefer this hospital pharmacy over other alternatives.	0.807	0.196	Valid
I will continue using this pharmacy service even if other alternatives are available.	0.848	0.196	Valid

Source: Processed data, 2026

Based on the validity test results for the Patient Loyalty variable, an analysis was conducted using Pearson Product Moment correlation between each statement item and the total score of the variable. The test results showed that all indicators had very high and significant correlations. The correlation coefficients for each item against the total score were: "I intend to use this hospital's pharmacy services again = 0.844," "I would recommend this hospital to others = 0.834," "I prefer this hospital's pharmacy to others = 0.807," and "I continue to use this pharmacy even though there are other alternatives = 0.848." All significance values showed Sig. (2-tailed) < 0.001 ($p < 0.05$), indicating a strong and unidirectional relationship between each item and the patient loyalty construct. Furthermore, all calculated r values were greater than the table r (0.196) for a sample size (n = 100), thus all statement items were declared valid. Thus, these four indicators can represent the construct of patient loyalty well and are suitable for use in further analysis.

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Table 4. Normality Test Results

Test Component	Value
Test Name	One-Sample Kolmogorov-Smirnov Test
Residual Type	Unstandardized Residual
Sample Size (N)	100
Mean	0.0000000
Standard Deviation	1.17551208
Most Extreme Differences (Absolute)	0.041
Most Extreme Differences (Positive)	0.036
Most Extreme Differences (Negative)	-0.041
Test Statistic	0.041
Asymp. Sig. (2-tailed)	0.200
Monte Carlo Sig. (2-tailed)	0.955
99% Confidence Interval Lower Bound	0.950
99% Confidence Interval Upper Bound	0.961

Source: SPSS output processed 2026

Based on the results of the normality test using the Kolmogorov-Smirnov method, the Asymp. Sig. (2-tailed) value was 0.200. This value is greater than the significance level used, which is 0.05 ($p > 0.05$). Thus, it can be concluded that the residual data in this study is normally distributed. This indicates that the normality assumption in the regression model has been met, allowing the multiple linear regression analysis to proceed to the next stage.

Table 5. Multicollinearity Test Results

Variable	Tolerance	VIF	Interpretation
Medication Availability	0.997	1.003	No multicollinearity
Patient Satisfaction	0.997	1.003	No multicollinearity

Source: SPSS output, processed 2026

The table above shows that the tolerance value for each variable is 0.997, which is greater than 0.10. Furthermore, the VIF value is 1.003, which is still less than the maximum limit of 10. Therefore, it can be concluded that there is no multicollinearity between the independent variables in this research's regression model. This indicates that the drug availability and patient satisfaction variables are not highly correlated with each other, making them suitable for use together in a regression analysis model to explain patient loyalty.

DOI: https://doi.org/10.71435/738357

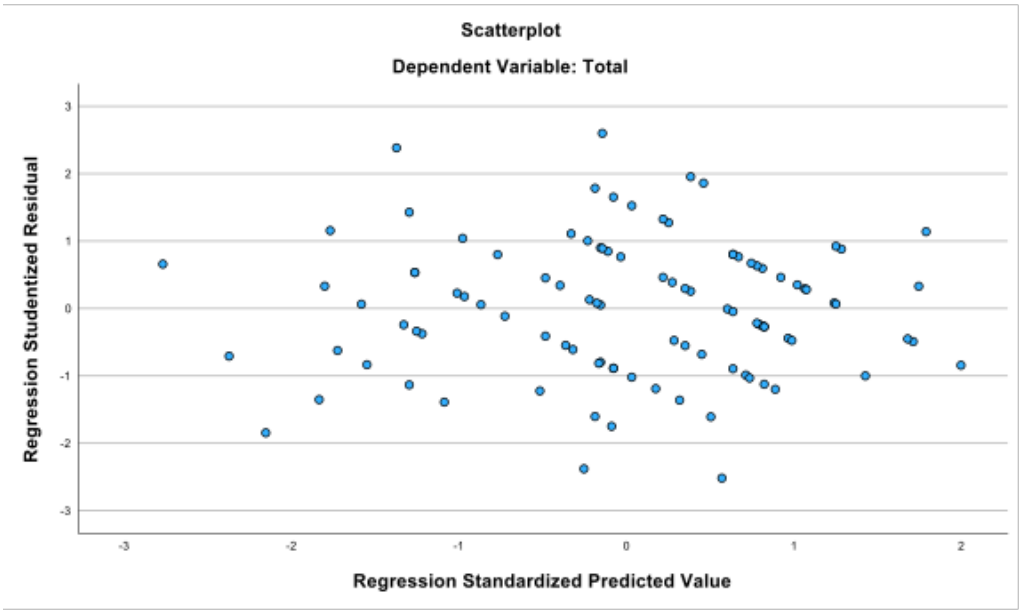

Figure 1. Heteroscedasticity Test Results

The scatterplot graph shows that the data points are randomly distributed around the zero line on the Y-axis and do not form any specific pattern, either narrowing, widening, or a wave pattern. This random distribution of points indicates that the residual variance is constant. Therefore, it can be concluded that the regression model in this study does not experience heteroscedasticity. Therefore, multiple linear regression analysis can be continued to test the effect of drug availability and patient satisfaction on patient loyalty.

Table 6. Results of the Linearity Test of Patient Satisfaction on Patient Loyalty

Component	F-value	Significance (Sig.)	Interpretation
Between Groups (Combined)	3.378	< 0.001	Significant relationship exists
Linearity	53.162	< 0.001	Relationship is linear
Deviation from Linearity	1.115	0.351	No significant deviation from linearity

Based on Table 6, the significance value for Linearity is <0.001 (<0.05), indicating a linear relationship between patient satisfaction and loyalty. Furthermore, the significance value for Deviation from Linearity is 0.351 (>0.05), indicating no deviation from the linear relationship. Therefore, it can be concluded that the relationship between patient satisfaction and loyalty is linear.

Table 7. Results of the Linearity Test of Drug Availability on Patient Loyalty

Component	F-value	Significance (Sig.)	Interpretation
Between Groups (Combined)	3.626	< 0.001	Significant relationship exists
Linearity	26.705	< 0.001	Relationship is linear
Deviation from Linearity	1.062	0.399	No significant deviation from linearity

Source: SPSS output, processed 2026

DOI: https://doi.org/10.71435/738357

Based on Table 7, the significance value for Linearity is <0.001 (<0.05), indicating a linear relationship between drug availability and patient loyalty. Furthermore, the significance value for Deviation from Linearity is 0.399 (>0.05), indicating no deviation from the linear relationship. Therefore, it can be concluded that the relationship between drug availability and patient loyalty is linear. Based on the overall results of the linearity test, it can be concluded that all independent variables in this study have a linear relationship with the dependent variable. Therefore, the linearity assumption in the multiple linear regression analysis has been met, allowing the regression analysis to proceed to the next stage.

Table 8. Results of the Simultaneous Significance Test (F Test)

Model Component	Sum of Squares	df	Mean Square	F-value	Significance (Sig.)	Interpretation
Regression	196.639	2	98.319	69.714	< 0.001	Model is statistically significant
Residual	136.801	97	1.410	—	—	Unexplained variance
Total	333.440	99	—	—	—	Total variance

Source: SPSS output, processed 2026

The ANOVA test results yielded a calculated F-value of 69.714 with a significance level of 0.001 ($p < 0.05$). This indicates that the regression model used in the study is statistically significant. Therefore, it can be concluded that drug availability and patient satisfaction simultaneously have a significant effect on patient loyalty.

Table 9. Regression Coefficient Results

Variable	Unstandardized Coefficient (B)	Std. Error	Standardized Coefficient (Beta)	t-value	Significance (Sig.)	Interpretation
Constant	2.901	1.132	—	2.563	0.012	Significant
Medication Availability	0.356	0.047	0.494	7.592	< 0.001	Significant positive effect
Patient Satisfaction	0.201	0.021	0.614	9.435	< 0.001	Significant positive effect

Source: SPSS output, processed 2026

Based on the results of the multiple linear regression analysis, the following regression equation was obtained: Loyalty = 2.901, 0.201 (Drug Availability), 0.356 (Patient Satisfaction). The constant of 2.901 indicates that if the drug availability and patient satisfaction variables are held constant, the patient loyalty value is 2.901. The drug availability coefficient of 0.201 indicates that every one-unit increase in drug availability is followed by a 0.201 increase in patient loyalty. The patient satisfaction coefficient of 0.356 indicates that every one-unit increase in patient satisfaction increases patient loyalty by 0.356.

DOI: https://doi.org/10.71435/738357

Table 10. F-Test Results (Simultaneous)

Model Component	Sum of Squares	df	Mean Square	F-value	Significance (Sig.)	Interpretation
Regression	196.639	2	98.319	69.714	< 0.001	Regression model is significant
Residual	136.801	97	1.410	—	—	Remaining unexplained variance
Total	333.440	99	—	—	—	Total variance

Source: SPSS output, processed

Based on the F-test results table above, the calculated F-value is 69.714 with a significance level of 0.001. This significance level is less than 0.05, so it can be concluded that drug availability and patient satisfaction simultaneously have a significant effect on patient loyalty. These results indicate that the regression model used in this study is fit to explain the relationship between drug availability and patient satisfaction on patient loyalty. Therefore, the hypothesis that drug availability and patient satisfaction simultaneously influence patient loyalty is accepted.

Table 11. Coefficient of Determination (Model Summary)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Interpretation
1	0.768	0.590	0.581	1.188	Strong relationship

Source: SPSS Output

The table above shows an R value of 0.590, indicating a very strong relationship between drug availability and patient satisfaction, leading to patient loyalty. The regression analysis results show a coefficient of determination (R Square) of 0.590. This value indicates that 59% of the variation in patient loyalty can be explained by the drug availability and patient satisfaction variables used in the research model. This indicates that these two independent variables have a significant contribution in explaining changes in patient loyalty to hospital pharmacy services. Meanwhile, the remaining 41% of the variation in patient loyalty is influenced by factors outside the research model that were not measured in this study. These factors can include the quality of healthcare provider communication, hospital image, waiting times, healthcare costs, and the patient's previous experience with healthcare services. These factors have been shown in various studies to play a significant role in shaping patient loyalty to healthcare facilities. The Adjusted R Square value of 0.581 indicates that after adjusting the number of variables and samples, the research model is still able to explain 58.1% of the variation in patient loyalty.

The Effect of Drug Availability on Patient Loyalty

Based on the results of the multiple linear regression analysis presented above, it was found that drug availability has a positive and significant effect on patient loyalty among pharmacy users at Dr. H. Soemarno Sosroadmodjo Tanjung Selor Regional General Hospital. This is indicated by a regression coefficient of 0.356 with a significance level of $p < 0.001$ and a calculated t-value of 7.592, which far exceeds the t-value. This finding indicates that every one-unit increase in patient perception of drug availability will be followed by a 0.356-unit increase in patient loyalty, assuming other variables are held constant.

DOI: https://doi.org/10.71435/738357

The partial coefficient of determination indicates that drug availability contributes substantially to variations in patient loyalty. The results of the hypothesis test, which showed a significance value below 0.05, statistically prove that the alternative hypothesis (Ha_1) stating a positive effect of drug availability on patient loyalty is accepted. These findings reinforce the argument that medication availability is not merely an operational aspect of pharmaceutical services, but rather a strategic factor that directly shapes patients' perceptions of service quality and ultimately influences their decision to remain loyal to hospital pharmacy services.

These findings have a strong theoretical basis within the framework of the healthcare quality model developed by Hannawa et al. (2024), which views healthcare quality through three main components: structure, process, and outcome. In the context of this research, medication availability is a structural component that serves as a fundamental input into the pharmaceutical service system. Endalamaw et al. (2024) emphasized that failure to optimally fulfill these structural components will disrupt the entire service process and lead to decreased outcomes such as patient satisfaction and loyalty. When prescribed medications are available in full and on time, patients feel assured of the therapy, which increases trust in the hospital institution.

In line with this perspective, Marzban et al. (2022) explained that medication availability is a key determinant in shaping patients' experiences during pharmaceutical services. Positive experiences resulting from a hospital's ability to consistently provide medications will create a sense of security and comfort for patients, which then develops into a long-term commitment to continue using the same service. Furthermore, emphasize that effective pharmaceutical logistics management, which encompasses planning, procurement, storage, distribution, and stock control of medications, is the foundation for optimal medication availability. Each stage of logistics management plays a strategic role in ensuring timely medication availability and meeting patient needs, thereby minimizing the risk of stockouts that could disrupt continuity of therapy.

From the perspective of healthcare consumer behavior theory, medication availability can also be viewed as part of value creation directly experienced by patients. Patients' perceived benefits increase significantly when their treatment needs can be fully met in one location without having to seek alternatives outside the hospital. This aligns with Expectation-Confirmation Theory, which states that satisfaction and loyalty are formed when actual service performance meets or exceeds patient expectations. Guaranteed medication availability is one of the most easily observed and evaluated performance indicators by patients. Therefore, when expectations regarding medication availability are met, a positive evaluation of the service is likely.

The results of this study are consistent with the findings of Herawati et al. (2025), who demonstrated that medication availability has a direct and strong influence on patient loyalty at the Pharmacy Unit of Hospital X, Bekasi City. The study found that when medications are fully available and easily accessible, patients feel comfortable and secure in undergoing treatment, which in turn strengthens loyalty to the hospital. Similar findings were also reported by Bethasari (2026), who concluded that medication availability, pharmacist counseling, and the quality of pharmaceutical services simultaneously have a significant influence on patient satisfaction and loyalty. This study confirms that drug availability is a key foundation for quality pharmaceutical services (Nurhayati et al., 2024).

The difference with previous research lies in the geographic context and characteristics of the hospitals studied. The studies were primarily conducted on the island of Java, with relatively better access to logistics distribution, while this study was conducted at Dr. H. Soemarno Sosroadmodjo Hospital in Tanjung Selor, North Kalimantan, with more complex geographic

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challenges and limited distribution infrastructure. Nevertheless, the effect of drug availability on patient loyalty remained significant, indicating that logistical challenges do not diminish the importance of this variable in shaping patient loyalty and may even further enhance patient sensitivity to drug availability issues. Bhatt et al. (2024) research further supports these findings by demonstrating that the availability of essential medications has a strong positive correlation with outpatient satisfaction in hospitals. Emphasized that medication availability is a key element in the perception of service quality because patients assess the effectiveness of services based on the hospital's ability to meet their therapeutic needs in a timely manner. This finding is relevant to research showing that medication availability impacts not only the functional aspects of services but also the psychological aspects of patients, such as feelings of trust and security during treatment.

Practically, these findings have important implications for the management of Dr. H. Soemarno Sosroadmodjo Tanjung Selor Regional General Hospital (RSD) in its efforts to increase patient loyalty by optimizing medication availability. The hospital needs to ensure that its medication requirement planning system is implemented accurately based on data on drug use patterns and disease epidemiology in the service area. Optimal stock control by implementing a min-max stock system and buffer stock for essential and strategic medications is a crucial step in preventing stock-outs. Furthermore, strengthening coordination with drug suppliers and utilizing information technology to monitor drug availability in real time can improve the responsiveness of the pharmaceutical logistics system.

From a theoretical perspective, these findings reinforce Walean et al. (2024) model by demonstrating that the structural component (drug availability) directly influences the outcome (patient loyalty) without being fully mediated by the process (patient satisfaction). This indicates that, in the context of regional hospital pharmaceutical services, drug availability has a direct, independent effect on patient loyalty. These findings enrich the healthcare management literature by providing empirical evidence that investing in structural aspects of services, particularly drug logistics systems, is an effective strategy for building long-term patient loyalty, particularly in areas with geographic challenges and limited distribution access.

The Effect of Patient Satisfaction on Patient Loyalty

The results of the multiple linear regression analysis indicate that patient satisfaction has a positive and significant influence on patient loyalty among pharmaceutical service users. This finding is evidenced by a regression coefficient of 0.201 with a significance level of $p < 0.001$ and a highly statistically significant t-value of 9.435. This regression coefficient indicates that every one-unit increase in patient satisfaction is followed by a 0.201-unit increase in patient loyalty. Furthermore, the standardized Beta coefficient for patient satisfaction is 0.614, higher than the Beta value for drug availability (0.494), indicating that patient satisfaction is a more dominant variable in influencing patient loyalty than drug availability.

The results of the hypothesis test, which showed a significance value below 0.05, statistically prove that the alternative hypothesis (Ha_2), which states a positive effect of patient satisfaction on patient loyalty, is accepted. These findings confirm that the higher the level of satisfaction a patient experience with the pharmaceutical services they receive, the greater their likelihood of continuing to use those services, recommending them to others, and maintaining their commitment to the hospital despite the availability of alternative services.

These findings are strongly grounded in the Expectation-Confirmation Theory (ECT) developed by AlSokkar et al. (2024). This theory explains that individual satisfaction is formed through a cognitive evaluation process in which the actual performance of a product or service

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is compared with initial expectations prior to consumption (Ramasamy et al., 2024). If actual performance meets or exceeds expectations, positive confirmation occurs, resulting in satisfaction; conversely, if actual performance falls short of expectations, negative disconfirmation occurs, resulting in dissatisfaction. In the context of pharmaceutical services, high patient satisfaction occurs when the service experience, including speed of service, staff friendliness, clarity of drug information, and convenience of the facility, meets or even exceeds the patient's initial expectations.

In the SERVQUAL framework proposed by Setiono & Hidayat (2022), patient satisfaction is measured through five dimensions of service quality: reliability, responsiveness, assurance, empathy, and tangibles. The results of the descriptive analysis in this study indicate that all five dimensions are in the high category, with average values ranging from 3.86 to 3.90. This indicates that patients generally give a positive assessment of the quality of pharmaceutical services at RSD dr. H. Soemarno Sosroadmodjo Tanjung Selor, which in turn contributes to high levels of patient satisfaction and loyalty. The difference from previous research lies in the significant influence of patient satisfaction on loyalty found in this study. The high partial coefficient of determination and Beta values indicate that patient satisfaction plays a significant role in explaining variations in patient loyalty, even more so than in previous studies in different contexts. This can be explained by the characteristics of the respondents, who were predominantly BPJS (Social Security Agency) patients (93%) with varying visit frequencies, where a satisfactory service experience was the primary determining factor for them to continue using the same hospital pharmacy services.

Practically, these findings imply that efforts to increase patient loyalty should focus on enhancing patient satisfaction through continuous improvement in the quality of pharmaceutical services. Hospital management needs to conduct regular evaluations of patient satisfaction levels using valid and reliable instruments and follow up on these evaluation results with measurable improvement programs. Training for pharmacists in interpersonal communication, patient-centered care, and service ethics is a crucial investment to improve the quality of interactions between staff and patients. Furthermore, reducing waiting times through optimizing service flows and utilizing information technology such as electronic queuing systems and online prescriptions can improve service responsiveness.

From a theoretical perspective, these findings reinforce the validity of Expectation-Confirmation Theory (Senthilrajah & Ahangama, 2025) in the context of healthcare services in Indonesia, particularly in regional hospital pharmacy services. This study provides empirical evidence that patient satisfaction, which is formed from the comparison between expectations and actual experiences, has a direct and dominant effect on patient loyalty. Furthermore, these findings also support the Quality-Satisfaction-Loyalty model which states that service quality and patient satisfaction are important factors contributing to the formation of patient loyalty. Thus, this study enriches the literature on healthcare marketing management by showing that in the context of regional hospitals with patient characteristics that are mostly users of national health insurance, patient satisfaction remains a major predictor of loyalty despite limitations in access and infrastructure.

The Simultaneous Effect of Drug Availability and Patient Satisfaction on Patient Loyalty

The results of the multiple linear regression analysis indicate that drug availability and patient satisfaction simultaneously have a significant effect on patient loyalty among pharmaceutical service users. This finding is evidenced by the calculated F-value of 69.714 with a significance level of $p < 0.001$, well below the significance limit of $\alpha = 0.05$. The coefficient of determination (R-square) of 0.590 indicates that 59.0% of the variation in patient loyalty can

DOI: https://doi.org/10.71435/738357

be jointly explained by drug availability and patient satisfaction, while the remaining 41.0% is explained by other variables outside the research model. The adjusted R-square of 0.581 indicates that after adjusting for the number of independent variables and sample size, the research model still explains 58.1% of the variation in patient loyalty.

The statistically significant F-test results prove that the alternative hypothesis (Ha_3) stating that there is a simultaneous effect of drug availability and patient satisfaction on patient loyalty is accepted. These findings confirm that both independent variables together have a strong predictive effect on patient loyalty, with patient satisfaction (Beta = 0.614) contributing more significantly than medication availability (Beta = 0.494). This indicates that in shaping patient loyalty, a satisfactory service experience carries a greater weight than structural factors such as medication availability, although both are equally important and complementary.

These findings can be explained through the integration of three primary theoretical frameworks that underpin this study: the Donabedian (2003) model, Expectation-Confirmation Theory (Oliver, 1980), and customer loyalty theory. In Donabedian's model, medication availability represents the structural component, a quality pharmaceutical service process (process) results in patient satisfaction, and patient loyalty is the outcome of an effective service system. The results indicate that structure and process contribute significantly to outcomes, with the process (patient satisfaction) having a greater influence. Expectation-Confirmation Theory (Vijay, 2025) explains that patient satisfaction is formed when the actual service experience meets or exceeds initial expectations. In this context, optimal medication availability is a crucial component shaping the patient service experience. When medications are available in full and on time, patient expectations regarding the effectiveness and smoothness of treatment are met, resulting in increased satisfaction. High satisfaction subsequently fosters loyalty, reflected in revisit intentions, recommendations, preferences, and commitment to the hospital. Thus, medication availability and patient satisfaction form an interconnected causal chain influencing patient loyalty.

From the perspective of customer loyalty theory, Abdrabou (2024) state that loyalty is a multidimensional construct encompassing behavioral loyalty (repurchase behavior) and attitudinal loyalty (positive attitudes and recommendations). The results of this study indicate that a combination of structural factors (drug availability) and psychological factors (patient satisfaction) collectively shape these two dimensions of loyalty. Patients who perceive good medication availability and high levels of satisfaction are more likely to not only return to the service (behavioral aspect) but also recommend the hospital to others and maintain long-term commitment (attitude aspect).

The results of this study align with the findings of Herawati et al. (2025), who showed that service quality, medication availability, and facilities simultaneously influence patient satisfaction and loyalty. This study emphasized that patient satisfaction acts as a mediating variable linking structural and process factors of service with patient loyalty. Similar findings were also reported by Tadesse et al. (2023), who concluded that pharmacist counseling, medication availability, and the quality of pharmaceutical services significantly influence patient satisfaction and loyalty, with satisfaction acting as a direct antecedent of loyalty. Indonesia found that patient satisfaction mediates the relationship between service quality, hospital image, trust, and patient loyalty. This study confirmed a partial mediation model in which service quality and hospital image influence loyalty both directly and indirectly through patient satisfaction. This finding is relevant to research showing that medication availability (as part of service quality) and patient satisfaction simultaneously influence loyalty, with patient satisfaction being the dominant variable.

DOI: https://doi.org/10.71435/738357

Indonesia also demonstrated that patient satisfaction acts as a significant mediator between service quality and hospital image on patient loyalty. The study found that improving service quality and hospital image will increase patient satisfaction, which in turn will increase patient loyalty. This finding reinforces research findings that patient satisfaction is a key psychological mechanism linking patient perceptions of the structural and process aspects of service delivery to long-term loyalty.

The difference with previous research lies in the substantial simultaneous contribution of both independent variables to patient loyalty found in this study ($R^2 = 0.590$ or 59.0%). This figure is relatively high compared to previous studies in the same field, indicating that this research model has good predictive power in explaining variations in patient loyalty. This can be attributed to the research context in a regional hospital with patients predominantly using the BPJS (Social Security Agency) program. Drug availability and patient satisfaction are highly sensitive factors in shaping loyalty due to the limited choice of alternative healthcare services in the area. Practically, these findings imply that the management of Dr. H. Soemarno Sosroadmodjo Tanjung Selor Regional General Hospital needs to manage drug availability and patient satisfaction in an integrated manner as part of a strategy to increase patient loyalty. Efforts to increase drug availability through optimizing the pharmaceutical logistics system must be balanced with improvements in service quality that focus on the patient experience. The hospital needs to develop an integrated quality management system that encompasses planning, control, evaluation, and continuous improvement in both aspects. Training programs for pharmacists, the development of clear standard operating procedures, and the use of information technology to monitor patient satisfaction in real time are strategic steps that can be implemented.

The hospital needs to benchmark with other healthcare facilities that have successfully increased patient loyalty through optimizing drug availability and patient satisfaction. Collaboration with local governments and the Health Office to strengthen the regional drug logistics system, including the development of district drug warehouses and an integrated distribution system, can help address the geographic challenges and infrastructure limitations that are major obstacles to drug availability in North Kalimantan. Regular patient satisfaction assessments using valid and reliable instruments, along with systematic follow-up on evaluation results, are key to successfully improving patient loyalty.

From a theoretical perspective, these findings provide an important contribution to the development of a conceptual model of the relationship between drug availability, patient satisfaction, and patient loyalty in the context of regional hospitals in Indonesia. This study strengthens Alibrandi et al. (2023) model by demonstrating that structure (drug availability) and process (patient satisfaction) simultaneously influence the outcome (patient loyalty), but with varying degrees of influence. Providing empirical evidence that, in the context of healthcare services in areas with limited access, patient satisfaction remains the primary predictor of loyalty, although structural factors such as drug availability also play a significant role.

This study advances the theory of customer loyalty in the context of healthcare services by demonstrating that patient loyalty in regional hospitals is a multidimensional phenomenon influenced by a combination of functional factors (drug availability) and emotional factors (patient satisfaction). The integration of these two factors into a single analytical model provides a more comprehensive understanding of the mechanisms underlying patient loyalty formation than previous studies, which tended to analyze these factors separately. Thus, this

DOI: https://doi.org/10.71435/738357

study not only replicates previous findings, but also provides significant theoretical elaboration for the development of health service management science.

Conclusion

Medication availability has been partially proven to have a significant impact on patient loyalty at the pharmacy unit of Dr. H. Soemarno Sosroadmodjo Regional General Hospital, Tanjung Selor. This indicates that medication availability is not only viewed as a minimum service standard, but also as a crucial factor influencing patient trust and decisions to continue using healthcare services. Consistent medication availability can ensure continuity of therapy and increase patients' positive perceptions of the quality of hospital services, thus contributing to patient loyalty. The results showed that the higher the level of patient satisfaction with the pharmaceutical services received, the higher the level of patient loyalty to the hospital. Patient satisfaction reflects the patient's perception of the quality of service received, including aspects of healthcare provider communication, speed of service, and the comfort of the service facility. Satisfied patients tend to have higher trust in healthcare institutions and are more likely to use the same service again and recommend it to others. Regression analysis results indicate that both independent variables jointly contribute to explaining variation in patient loyalty. However, patient satisfaction has a stronger influence than medication availability. This suggests that, in the context of regional hospital pharmaceutical services, patient loyalty is more influenced by the quality of the service experience perceived by patients than by structural service factors such as medication availability.

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