

The Effect of Human Resource Competence and Drug Management System on Patient Satisfaction with Service Quality as a Mediating Variable at the Pharmacy Installation of Ryacudu Regional General Hospital, North Lampung

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Abstract

Pharmaceutical service quality is essential for addressing patient needs and fostering satisfaction. Human resource (HR) competence and drug management systems are key factors supporting the delivery of high-quality pharmaceutical services; therefore, their relationship with patient satisfaction through service quality warrants further investigation. This study aimed to analyze the effects of human resource competence and drug management systems on patient satisfaction, with service quality serving as a mediating variable, at the Pharmacy Department of Ryacudu Regional General Hospital, North Lampung. A quantitative explanatory survey design was applied, involving 154 patients and 20 pharmacy personnel as supporting respondents at the Pharmacy Installation of Ryacudu Regional General Hospital, North Lampung, resulting in a total of 174 respondents. Data were analyzed using Structural Equation Modeling–Partial Least Squares (SEM-PLS) with SmartPLS 4.0 software. The results revealed that human resource competence and drug management systems had a positive and significant effect on both service quality and patient satisfaction. Service quality was also positively and significantly related to patient satisfaction and significantly mediated the effects of human resource competence and drug management systems on patient satisfaction. These findings indicate that improving human resource competence and strengthening drug management systems through enhanced service quality can contribute to higher levels of patient satisfaction.

Keywords:

Human Resource Competence; Drug Management System; Service Quality; Patient Satisfaction; Pharmacy Installation.

1. INTRODUCTION

Hospitals are healthcare institutions responsible for delivering services that are high-quality, safe, effective, and patient-centered. One of the key units contributing to the achievement of these objectives is the pharmacy department, which plays a vital role in ensuring the availability of medicines and providing pharmaceutical services to the community. Optimal pharmaceutical services are not limited to drug availability but also include drug information provision, therapy monitoring, and timely and accurate service delivery. High-quality pharmaceutical services can enhance public trust in hospitals and support successful therapeutic outcomes, making service quality improvement within pharmacy departments a priority in healthcare delivery (Fadilah et al., 2022).

Patient satisfaction serves as a key measure of healthcare service performance, as it indicates how effectively the services provided correspond to patients' needs and expectations. A high degree of satisfaction may encourage patient loyalty and enhance the hospital's reputation as a reliable healthcare provider. In pharmaceutical care, satisfaction is affected by several aspects, including the promptness of service, the courtesy of healthcare staff, the accuracy of medication dispensing, and the clarity of instructions regarding

proper drug use. Conversely, services that fail to meet patient expectations may result in dissatisfaction and reduce public trust in healthcare institutions (Sukma & Wahyuningsih, 2024).

One of the factors contributing to patient satisfaction is the competence of human resources (HR) working in pharmacy departments. HR competence encompasses knowledge, technical skills, communication abilities, professional attitudes, and responsibility in providing patient care. Competent pharmacy personnel are more capable of delivering services in accordance with professional standards, providing appropriate medication counseling, and addressing service-related problems effectively. In contrast, inadequate competence may reduce service quality and patient satisfaction (Azizatunnisa et al., 2025).

In addition to HR competence, drug management systems are another crucial determinant of pharmaceutical service performance. Drug management includes planning, procurement, storage, distribution, and monitoring of medication use to ensure that medicines are available in the right type, quantity, and time. An effective drug management system can ensure continuity of care and prevent stock shortages that may disrupt patient services. Conversely, inadequate drug management may reduce service effectiveness and negatively affect patient satisfaction (Mulyanti et al., 2023).

The relationship between HR competence, drug management systems, and patient satisfaction is closely associated with service quality. According to Parasuraman et al. (1988), service quality consists of five dimensions namely tangibles, reliability, responsiveness, assurance, and empathy. Service quality reflects a provider's ability to meet patients' needs and expectations through timely, accurate, safe, and patient-oriented services. Although the SERVQUAL model remains an important theoretical foundation for assessing perceived service quality, recent healthcare research has increasingly emphasized that service quality should also be understood in relation to patient-centeredness, service experience, responsiveness, and the specific characteristics of healthcare delivery. Therefore, the SERVQUAL framework remains relevant as a foundation while requiring contextual interpretation when applied to pharmaceutical services. Service quality is closely linked to patient satisfaction, indicating that higher service quality is likely to result in greater patient satisfaction. These findings are consistent with the study conducted by Husada et al. (2025), which demonstrated that the quality of pharmaceutical services positively influenced outpatient satisfaction. Therefore, service quality can be regarded as a key determinant in enhancing patient satisfaction within pharmaceutical care settings.

HR competence and drug management systems are strategic factors supporting pharmaceutical service quality. This perspective is consistent with management theory, which recognizes human resources and organizational systems as essential elements in achieving organizational goals through planning, organizing, implementing, and controlling functions (Terry & Rue, 2020; Robbins et al., 2024). Competent pharmacy personnel can provide professional, accurate, and responsive services, while effective drug management systems ensure the availability, safety, and appropriate use of medications (Rumangkang et al., 2023). If these factors are not optimally managed, service delivery may be disrupted, leading to lower service quality and patient satisfaction. Therefore, service quality can be viewed as a mechanism linking HR competence and drug management systems to patient satisfaction.

Previous research has addressed service quality, patient satisfaction, and the factors associated with these outcomes. Krestopi et al. (2025) reported that service quality positively affected patient satisfaction. Similarly, Wahyuningtyas et al. (2026) found that human resource competence influenced patient loyalty through patient satisfaction, while Somba et al. (2025) demonstrated that drug management practices affected service quality in hospital pharmacy departments. However, these studies generally examined the relationships among variables separately and did not provide a comprehensive understanding of how HR competence and drug management systems simultaneously influence patient satisfaction through service quality in hospital pharmaceutical services. Furthermore, research examining service quality as an intermediary between HR competence, drug management systems, and patient satisfaction is still scarce, particularly within regional hospital pharmacy settings. Yet, service quality is directly experienced by patients and may represent a key pathway through which human resource quality and drug management effectiveness influence patient satisfaction.

Based on these considerations, the present study introduces a distinctive perspective by integrating HR competence and drug management systems within a single research model and positioning service quality as a mediating variable to explain their effects on patient satisfaction. Applying this model in the pharmacy department of Ryacudu Regional General Hospital, North Lampung, is expected to generate empirical insights into the mechanisms underlying these relationships within the context of pharmaceutical services in regional hospitals.

Drawing upon relevant theories and previous research findings, a conceptual framework was developed to explain the interrelationships among Human Resource Competence, the Drug Management System, Service Quality, and Patient Satisfaction are organized into a conceptual framework. This framework depicts the proposed direct and indirect associations among the variables under investigation and provides the foundation for formulating the research hypotheses. The proposed conceptual framework is depicted in Figure 1.

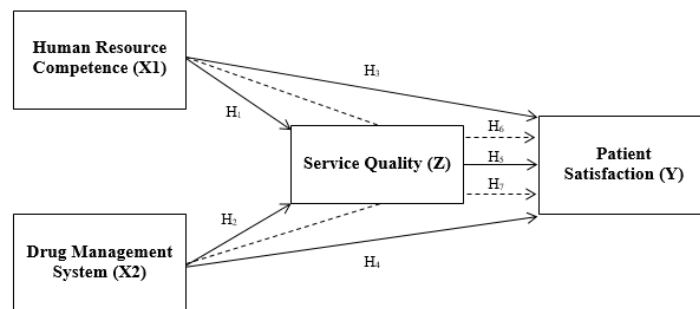


Figure 1. Conceptual Model

Figure 1 shows that Human Resource Competence and the Drug Management System are proposed to have direct effects on Service Quality and Patient Satisfaction. In addition, Service Quality is positioned as a mediating variable that explains the indirect effects of Human Resource Competence and the Drug Management System on Patient Satisfaction. Based on this conceptual framework, seven research hypotheses were developed and tested using the SEM-PLS approach.

A preliminary survey conducted at the Pharmacy Department of Ryacudu Regional General Hospital, North Lampung, identified several issues that may affect service quality and patient satisfaction. Initial interviews with 30 outpatients revealed that 40.0% complained about long waiting times for medication services, 30.0% reported receiving incomplete information regarding medication dosage, administration instructions, and side effects, and 23.3% had experienced delays in obtaining prescribed medications due to lengthy service processes. In addition, observations indicated a shortage of pharmacy personnel during certain service hours, resulting in suboptimal dispensing processes and medication counseling activities.

This study aimed to analyze the effects of human resource competence and drug management systems on patient satisfaction, with service quality serving as a mediating variable, at the Pharmacy Department of Ryacudu Regional General Hospital, North Lampung. The findings are expected to support initiatives aimed at strengthening staff capabilities, improving pharmaceutical inventory management, and enhancing the quality of pharmacy services. In addition, the results may provide valuable input for hospital administrators in evaluating service performance and formulating policies related to workforce development and medication management.

2. RESEARCH METHOD

A quantitative explanatory survey with a cross-sectional perspective was applied in this study to investigate the direct and indirect relationships among human resource competence, drug management practices, service quality, and patient satisfaction within the Pharmacy Installation of Ryacudu Regional General Hospital, North Lampung. The research utilized both primary and secondary data sources. Questionnaire responses from patients and pharmacy personnel constituted the primary data, while supporting information was extracted from institutional documents associated with pharmaceutical service operations and medication management processes.

The target population included patients who utilized services at the Pharmacy Installation of Ryacudu Regional General Hospital, North Lampung, as well as all pharmacy personnel employed within the unit. Patient respondents were selected through a purposive sampling technique. Eligibility criteria included being at least 18 years old, having completed the pharmaceutical service process and received prescribed medications, being willing to participate in the study, and possessing the ability to communicate effectively and complete the questionnaire. Individuals experiencing emergency conditions, communication difficulties, cognitive limitations, incomplete questionnaire responses, or refusal to participate were excluded. Based on an average patient volume of 250 individuals during the study period, the Slovin formula with a 5% error tolerance produced a sample size of 154 patients. In addition, all 20 pharmacy staff members were recruited using a total sampling approach, resulting in a final sample of 174 respondents.

The study variables consisted of human resource competence (X1), drug management system (X2), service quality (Z), and patient satisfaction (Y). Human resource competence was measured using six indicators: technical ability, interpersonal skills, communication skills, compliance with standard operating procedures (SOPs), ability to provide patient education, and ability to resolve service-related problems. The drug management system was measured based on the accuracy of planning, procurement, stock availability, distribution, storage, and the effectiveness of drug inventory control. Patient satisfaction was measured based on satisfaction with the speed of medication services, staff friendliness, clarity of drug information, drug availability, prescription service accuracy, and overall service. Meanwhile, service quality as a mediating variable was measured based on the five dimensions of the SERVQUAL model: tangibles, reliability,

responsiveness, assurance, and empathy (Parasuraman et al., 1988). A five-point Likert scale was consistently applied to measure all variables examined in the study.

Data were collected by distributing questionnaires to respondents who met the predetermined eligibility criteria. After the data collection process had been completed, the responses were carefully reviewed, coded, and tabulated to maintain data quality and facilitate subsequent analysis. The statistical procedures comprised both descriptive and model-based inferential analyses. Descriptive statistics were employed to characterize the respondents and illustrate the distribution of the observed variables based on frequencies, percentages, mean values, and standard deviations.

The hypothesized associations were examined using Partial Least Squares–Structural Equation Modeling (PLS-SEM) with SmartPLS 4.0 software. This analytical approach was utilized to evaluate both direct associations and relationships involving mediating effects among the research constructs. The measurement model was assessed in terms of convergent validity, with acceptable validity indicated by outer loading values of at least 0.70 and Average Variance Extracted (AVE) values greater than 0.50. Discriminant validity was subsequently evaluated using cross-loadings, the Fornell–Larcker criterion, and Heterotrait–Monotrait Ratio (HTMT) values below 0.90. Construct reliability was established when the Cronbach’s alpha and composite reliability coefficients exceeded 0.70.

Assessment of the structural model incorporated several key indicators, namely the coefficient of determination (R^2), predictive relevance (Q^2), effect size (f^2), and model fit based on a Standardized Root Mean Square Residual (SRMR) value below 0.08. These measures were utilized to evaluate the model’s explanatory capability, predictive performance, and the relative contribution of exogenous constructs to endogenous variables. Hypothesis testing was performed using the bootstrapping procedure provided in SmartPLS 4.0. A hypothesized relationship was regarded as statistically significant when the t-statistic exceeded 1.96 and the p-value was below 0.05, provided that the sign of the path coefficient corresponded to the direction specified in the hypothesis.

The mediating function of service quality was investigated by examining the specific indirect effect obtained through bootstrapping. A mediation effect was considered statistically significant when the indirect relationship satisfied the criteria of p-value < 0.05 or t-statistic > 1.96. The subsequent classification of the mediation effect was established by comparing the statistical significance of the direct and indirect pathways.

3. RESULTS AND DISCUSSION

3.1. Results

3.1.1. Respondent Characteristics

To describe the demographic profile of the study participants, information regarding age, sex, and educational level was collected and analyzed. The respondents consisted of patients receiving pharmaceutical services and pharmacy personnel working at Ryacudu Regional General Hospital, North Lampung. The frequency distribution of these demographic variables is presented in Table 1.

Table 1. Respondent Characteristics

Characteristics	Category	Patients (n=154)		Pharmacy Personnel (n=20)		Total (n=174)	
		Frequency	%	Frequency	%	Frequency	%
Age	18-25 years	28	18,2	2	10,0	30	17,2
	26-35 years	38	24,7	7	35,0	45	25,9
	36-45 years	36	23,4	6	30,0	42	24,1
	46-55 years	29	18,8	4	20,0	33	19,0
	>55 years	23	14,9	1	5,0	24	13,8
Gender	Male	67	43,5	6	30,0	73	42,0
	Female	87	56,5	14	70,0	101	58,0
Education	Elementary school/equivalent	18	11,7	0	0,0	18	10,3
	Junior high school/equivalent	25	16,2	0	0,0	25	14,4
	Senior high school/equivalent	70	45,5	3	15,0	73	42,0
	Diploma (D3)	15	9,7	11	55,0	26	14,9
	Bachelor's degree (S1)	22	14,3	4	20,0	26	14,9
	Pharmacist	0	0,0	2	10,0	2	1,1
	Professional Degree						

Master's degree (S2)	4	2,6	0	0,0	4	2,3
Total	154	100%	20	100%	174	100%

Source: Processed data, 2026.

Based on Table 1, the respondent characteristics indicate that the largest age group was 26–35 years, comprising 45 respondents (25.9%). The majority of respondents were female, with 101 respondents (58.0%), while the most common educational level was senior high school or equivalent, with 73 respondents (42.0%). Among the pharmacy personnel, the majority had a Diploma (D3) educational background, comprising 11 respondents (55.0%).

3.1.2. Descriptive Statistics of the Study Variables

Descriptive analysis was performed to summarize the respondents' responses across the four constructs examined in this study, Human Resource Competence, Drug Management System, Service Quality, and Patient Satisfaction. The descriptive results for each research variable are summarized in Table 2.

Table 2. Descriptive Statistics of the Study Variables

Variable	Number of Indicators	Mean	Category
Human Resource Competence (X1)	12	3,67	Baik
Drug Management System (X2)	12	3,53	Baik
Service Quality (Z)	15	3,64	Baik
Patient Satisfaction (Y)	12	3,58	Baik

Source: Processed data, 2026.

The results presented in Table 2 show that the mean scores for all variables were classified as good. Human Resource Competence recorded the highest average value at 3.67, followed by Service Quality at 3.64, Patient Satisfaction at 3.58, and the Drug Management System at 3.53. These findings indicate that respondents perceived human resource competence, the drug management system, service quality, and patient satisfaction at the Pharmacy Installation of Ryacudu Regional General Hospital, North Lampung, to be good. Nevertheless, the Drug Management System had the relatively lowest mean score among the variables, indicating the need for further improvement to support drug availability and the smooth delivery of pharmaceutical services.

3.1.3. Evaluation of the Measurement Model (Outer Model)

The outer model was examined to verify that the study constructs and their respective indicators satisfied the required validity and reliability standards. Assessment included convergent validity, discriminant validity, and construct reliability. The findings from this assessment are reported in Table 3.

Table 3. Measurement Model (Outer Model) Evaluation Results

Construct	Number of Indicators	Outer Loading Range	AVE	Cronbach's Alpha
Human Resource Competence (X1)	12	0,742–0,836	0,632	0,901
Drug Management System (X2)	12	0,746–0,851	0,626	0,882
Service Quality (Z)	15	0,741–0,854	0,645	0,934
Patient Satisfaction (Y)	12	0,768–0,858	0,662	0,921
Criterion		≥ 0,70	≥ 0,50	≥ 0,70

Source: Processed data, 2026.

The findings reported in Table 3 demonstrate that all constructs satisfied the predetermined validity and reliability requirements. Convergent validity was supported by the outer loading coefficients of all indicators, which exceeded 0.70, together with Average Variance Extracted (AVE) values that consistently surpassed 0.50. The assessment of discriminant validity also produced satisfactory outcomes. Each indicator showed its strongest loading on the construct for which it was designed, while the Fornell–Larcker criterion confirmed that the square root of AVE for each construct was greater than its correlations with the other constructs. Furthermore, the HTMT coefficients ranged between 0.344 and 0.701, remaining below the established threshold of 0.90. Regarding reliability, both Cronbach's alpha and composite reliability coefficients for all constructs were above 0.70. Taken together, these findings confirm that the measurement model achieved adequate levels of validity and reliability, thereby providing sufficient grounds for proceeding with the structural model evaluation.

3.1.4. Evaluation of the Structural Model (Inner Model)

3.1.4.1. Coefficient of Determination (R^2)

The R^2 value was examined to determine how well the exogenous constructs accounted for variation in the endogenous constructs. The assessment covered the influence of Human Resource Competence and the

Drug Management System on Service Quality, as well as their combined influence with Service Quality on Patient Satisfaction. R^2 values of 0.75, 0.50, and 0.25 were interpreted as strong, moderate, and weak explanatory power, respectively. The results are reported in Table 4.

Table 4. Results of the Coefficient of Determination Test (R^2)

Endogenous Variable	R^2	R^2 Adjusted	Category
Service Quality (Z)	0,353	0,345	Weak
Patient Satisfaction (Y)	0,665	0,658	Moderate

Source: Processed data, 2026.

Table 4 shows that Service Quality (Z) obtained an R^2 of 0.353, meaning that Human Resource Competence (X1) and the Drug Management System (X2) explained 35.3% of its variance, while 64.7% was attributable to factors outside the model. This value indicates weak explanatory power. For Patient Satisfaction (Y), the R^2 value reached 0.665, indicating that Human Resource Competence (X1), the Drug Management System (X2), and Service Quality (Z) jointly explained 66.5% of the variance in Patient Satisfaction, while the remaining 33.5% was explained by factors outside the research model. This result indicates moderate explanatory power, with the model explaining Patient Satisfaction more strongly than Service Quality.

3.1.4.2. Predictive Relevance (Q^2)

The model's predictive capability for the endogenous variables was assessed through the Q^2 statistic. A Q^2 value exceeding 0 signifies that the model demonstrates predictive relevance, with the findings presented in Table 5.

Table 5. Predictive Relevance (Q^2) Results

Endogenous Variable	Q^2	Interpretation
Service Quality (Z)	0,267	Has Predictive Relevance
Patient Satisfaction (Y)	0,439	Has Predictive Relevance

Source: Processed data, 2026.

Table 5 shows that the Q^2 values for Service Quality (Z) and Patient Satisfaction (Y) were 0.267 and 0.439, respectively. Since both values exceeded 0, the model demonstrated predictive relevance for the two endogenous variables. The higher Q^2 value for Patient Satisfaction indicates stronger predictive capability than that for Service Quality. Overall, the model showed adequate predictive relevance for both constructs at the Pharmacy Installation of Ryacudu Regional General Hospital, North Lampung.

3.1.4.3. Effect Size (f^2)

To determine the extent to which each independent variable contributes to the endogenous constructs, the study employed the effect size (f^2) measure. The magnitude of the effect was interpreted according to three levels, with f^2 values of 0.02, 0.15, and 0.35 representing small, medium, and large effects, respectively. The findings are presented in Table 6.

Table 6. Effect Size (f^2) Results

Variable Relationship	f^2	Category
Human Resource Competence (X1) → Service Quality (Z)	0,186	Medium
Drug Management System (X2) → Service Quality (Z)	0,128	Small
Human Resource Competence (X1) → Patient Satisfaction (Y)	0,091	Small
Drug Management System (X2) → Patient Satisfaction (Y)	0,117	Small
Drug Management System (X2) → Patient Satisfaction (Y)	0,312	Medium

Source: Processed data, 2026.

Based on Table 6, Human Resource Competence (X1) had a medium effect size on Service Quality (Z) ($f^2 = 0.186$), whereas the Drug Management System (X2) had a small effect size on Service Quality ($f^2 = 0.128$). For Patient Satisfaction (Y), both Human Resource Competence ($f^2 = 0.091$) and the Drug Management System ($f^2 = 0.117$) had small effect sizes. Meanwhile, Service Quality (Z) had a medium effect size on Patient Satisfaction (Y), with an f^2 value of 0.312. The largest effect was therefore found in the relationship between Service Quality and Patient Satisfaction, followed by Human Resource Competence and Service Quality, indicating relatively greater contributions of these relationships to the model.

3.1.4.4. Standardized Root Mean Square Residual (SRMR)

Model fit was assessed through the Standardized Root Mean Square Residual (SRMR), which reflects the discrepancy between the observed correlation matrix and the correlation matrix reproduced by the estimated model. An SRMR value below 0.08 was considered indicative of an acceptable level of model fit. The findings of the model fit assessment are reported in Table 7.

Table 7. Goodness of Fit Results Based on SRMR

Indicator	Value	Criterion	Interpretation
SRMR	0,067	< 0,08	Good model fit

Source: Processed data, 2026.

Based on Table 7, the SRMR value was 0.067, which was lower than 0.08, indicating good model fit. Thus, the research model demonstrated an adequate level of fit with the data and could proceed to hypothesis testing using the bootstrapping procedure. Based on the inner model evaluation, which included R^2 , Q^2 , f^2 , and SRMR, the research model demonstrated adequate explanatory and predictive capabilities and good model fit. Hypothesis testing was subsequently conducted using the bootstrapping procedure.

3.1.5. Hypothesis Testing

The hypothesized relationships among the study variables were examined through hypothesis testing using the bootstrapping procedure implemented in SmartPLS 4.0. The analysis adopted a 5% significance threshold, with statistical support established when the t-statistic was greater than 1.96 and the p-value was less than 0.05. The sign of each relationship was identified from the path coefficient, whereas mediation effects were examined using the specific indirect effect. The complete findings are reported in Table 8.

Table 8. Hypothesis Testing Results

Hypothesis	Variable Relationship	Coefficient	t-statistic	p-value	Decision
H ₁	X ₁ → Z	0,369	4,821	0,000	Supported (Significant)
H ₂	X ₂ → Z	0,281	3,614	0,000	Supported (Significant)
H ₃	X ₁ → Y	0,184	2,687	0,007	Supported (Significant)
H ₄	X ₂ → Y	0,167	2,421	0,016	Supported (Significant)
H ₅	Z → Y	0,556	8,127	0,000	Supported (Significant)
H ₆	X ₁ → Z → Y	0,205	4,063	0,000	Supported (Significant Mediation)
H ₇	X ₂ → Z → Y	0,156	3,289	0,001	Supported (Significant Mediation)

Source: Processed data, 2026.

Based on the hypothesis testing results, all seven hypotheses were supported. The findings are summarized as follows.

- H₁: Human Resource Competence (X₁) positively and significantly affected Service Quality (Z), with $\beta = 0.369$, $t = 4.821$, and $p = 0.000$. Therefore, H₁ was supported. This finding shows that greater competence among pharmacy personnel was associated with improved service quality.
- H₂: The Drug Management System (X₂) had a positive and significant effect on Service Quality (Z), with $\beta = 0.281$, $t = 3.614$, and $p = 0.000$. Therefore, H₂ was supported. This indicates that a better drug management system was associated with higher pharmaceutical service quality.
- H₃: Human Resource Competence (X₁) significantly and positively influenced Patient Satisfaction (Y), with $\beta = 0.184$, $t = 2.687$, and $p = 0.007$. Therefore, H₃ was supported. Thus, higher pharmacy personnel competence was associated with greater patient satisfaction.
- H₄: The Drug Management System (X₂) had a positive and significant effect on Patient Satisfaction (Y), with $\beta = 0.167$, $t = 2.421$, and $p = 0.016$. Therefore, H₄ was supported. This finding indicates that improved drug management was associated with higher patient satisfaction.
- H₅: Service Quality (Z) demonstrated a positive and significant effect on Patient Satisfaction (Y), with $\beta = 0.556$, $t = 8.127$, and $p = 0.000$. Therefore, H₅ was supported. This result indicates that better pharmaceutical service quality was associated with greater patient satisfaction.
- H₆: Service Quality (Z) significantly mediated the relationship between Human Resource Competence (X₁) and Patient Satisfaction (Y), with $\beta = 0.205$, $t = 4.063$, and $p = 0.000$. Therefore, H₆ was supported. This finding indicates that Human Resource Competence was related to Patient Satisfaction through both direct and indirect pathways via Service Quality.
- H₇: Service Quality (Z) significantly mediated the relationship between the Drug Management System (X₂) and Patient Satisfaction (Y), with $\beta = 0.156$, $t = 3.289$, and $p = 0.001$. The result supports H₇ and indicates that the Drug Management System was related to Patient Satisfaction through both its direct relationship and its indirect relationship via Service Quality.

3.2. Discussion

3.2.1. The Effect of Human Resource Competence on Service Quality

Human Resource Competence (X₁) was found to significantly and positively influence Service Quality (Z) at the Pharmacy Installation of Ryacudu Regional General Hospital, North Lampung. The analysis produced a path coefficient of 0.369, with a t-statistic of $4.821 > 1.96$ and a p-value of $0.000 < 0.05$, confirming support for H₁. The finding suggests that stronger competence among pharmacy personnel is associated with better pharmaceutical service quality. The descriptive analysis also showed a mean score of 3.67 for Human

Resource Competence, which was classified as good. This condition indicates that pharmacy personnel were perceived to have adequate technical abilities, work carefully, communicate effectively with patients, provide services courteously, and explain medication use adequately. These competencies constitute an important foundation for providing accurate, safe, and patient-centered pharmaceutical services.

Theoretically, the positive effect of human resource competence on service quality can be explained through management theory, which positions human resources as one of the key elements in achieving organizational objectives through the processes of planning, organizing, implementing, and controlling (Terry & Rue, 2020; Suwatno et al., 2022; Darmanto et al., 2022; Robbins et al., 2024). From a hospital management perspective, healthcare personnel are a strategic component that determines the effectiveness of service delivery because hospital service quality depends not only on facilities and systems but also on personnel's ability to perform service functions professionally (Azwar, 2020; Notoatmodjo, 2021; Ekawaty et al., 2024; Sudirman et al., 2024; Anies, 2023). The concept of human resource competence explains that the knowledge, skills, abilities, and work attitudes possessed by personnel determine their ability to perform their duties effectively (Wibowo, 2023; Sedarmayanti, 2022). This is consistent with Parasuraman et al. (1988) service quality theory, which identifies reliability, responsiveness, assurance, empathy, and tangibles as important dimensions of service quality. Good competence enables pharmacy personnel to provide reliable and responsive services, ensure the accuracy of medication information and use, and demonstrate empathy toward patients.

The findings of this study are consistent with previous empirical evidence emphasizing the importance of human resource competence in enhancing the delivery of pharmaceutical services. Nopita et al. (2024) stated that drug management is influenced by human resource competence, information systems, leadership, and organizational support. Daeli et al. (2024) also showed that successful drug management is influenced by human resources, in addition to infrastructure, funding, and management systems. Furthermore, Wahyuningtyas et al. (2026) demonstrated that human resource competence and pharmacy service waiting time affected outpatient satisfaction, which subsequently influenced patient loyalty. Fadilah et al. (2022) also showed that the quality of pharmaceutical services was associated with patient satisfaction. These findings strengthen the results of the present study, indicating that personnel with adequate knowledge, skills, communication abilities, and understanding of procedures are able to provide services more effectively, accurately, and in accordance with patients' needs.

Thus, Human Resource Competence is an important factor in improving the quality of pharmaceutical services. The better the competence of pharmacy personnel, the greater their ability to provide services in accordance with established procedures, communicate medication information clearly, respond to patients' questions and complaints, and deliver patient-centered services. These factors support the continuous improvement of pharmaceutical service quality at the Pharmacy Installation of Ryacudu Regional General Hospital, North Lampung.

3.2.2. The Effect of the Drug Management System on Service Quality

The analysis confirmed a positive and significant relationship between the Drug Management System (X2) and Service Quality (Z). The estimated path coefficient was 0.281, accompanied by a t-statistic of 3.614 > 1.96 and a p-value of 0.000 < 0.05, indicating support for H2. These findings suggest that improvements in drug management are associated with higher-quality services at the Pharmacy Installation of Ryacudu Regional General Hospital, North Lampung. From the descriptive analysis, the Drug Management System obtained a mean score of 3.53, which was classified as good. This indicates that respondents perceived the drug management processes, including needs planning, procurement, availability, storage, dispensing, and inventory control, to have been implemented adequately. This condition is important because the continuity of pharmaceutical services is strongly influenced by the hospital's ability to ensure that medications are available when needed.

Based on management theory, the management of organizational resources through the functions of planning, organizing, implementing, and controlling is an important process for achieving organizational objectives effectively and efficiently (Terry & Rue, 2020; Suwatno et al., 2022; Darmanto et al., 2022; Robbins et al., 2024). From a hospital management perspective, the drug management system is an integral part of hospital service delivery because the availability of the right types and quantities of medications, with appropriate quality, timing, and location, supports the smooth delivery of patient care (Azwar, 2020; Notoatmodjo, 2021; Ekawaty et al., 2024; Sudirman et al., 2024; Anies, 2023). Meanwhile, the stages of drug planning, procurement, storage, distribution, utilization, and monitoring need to be implemented in an integrated manner to ensure that medications are available when needed and that services can be delivered without disruption (Mulyanti et al., 2023; Rumangkang et al., 2023). This condition is related to service quality theory, particularly the dimensions of reliability and responsiveness, because an effective drug management system enables personnel to provide services accurately, consistently, promptly, and responsively to patients' needs (Tjiptono & Chandra, 2022).

This result aligns with evidence reported in earlier research, demonstrating that drug management is an important factor in supporting pharmaceutical services. Mulyanti et al. (2023) found that several stages of the drug management system were still not optimal, indicating the need for improvements in drug planning, procurement, and distribution. Rumangkang et al. (2023) also showed that several drug management indicators

did not yet meet established standards, requiring improvement strategies to enhance the quality of pharmaceutical services. Furthermore, Somba et al. (2025) demonstrated that drug planning, procurement, receipt, and storage are important components of drug management that are associated with service quality in hospital pharmacy installations. Daeli et al. (2024) found that drug management is influenced by human resources, infrastructure, funding, and management systems, while Azizatunnisa et al. (2025) highlighted the importance of integrating human, organizational, and technological aspects in supporting drug management information systems. These findings reinforce the results of the present study, indicating that effective drug management can reduce the likelihood of drug stockouts, dispensing errors, service delays, and disruptions in the pharmaceutical service process.

Thus, the better the drug management system implemented by the hospital, the greater its ability to ensure drug availability and support the smooth delivery of pharmaceutical services. Effective management, from planning and procurement to storage, distribution, and monitoring, enables services to be delivered effectively, efficiently, promptly, and in accordance with patients' needs, ultimately contributing to improved service quality at the Pharmacy Installation of Ryacudu Regional General Hospital, North Lampung.

3.2.3. The Effect of Human Resource Competence on Patient Satisfaction

Human Resource Competence (X1) demonstrated a positive and statistically significant relationship with Patient Satisfaction (Y). The analysis produced a path coefficient of 0.184, with a t-statistic of $2.687 > 1.96$ and a p-value of $0.007 < 0.05$. These statistical results provide support for H3 and indicate that higher competence among pharmacy personnel is associated with increased patient satisfaction. Good competence is reflected in personnel's ability to provide medication information, explain medication instructions, serve patients politely and courteously, and provide solutions when patients encounter difficulties during the service process. Descriptively, Human Resource Competence had a mean score of 3.67 and was categorized as good, indicating that the personnel's ability to provide services was perceived as adequate.

This positive effect is consistent with management theory, which positions human resources as one of the primary elements in achieving organizational objectives through the functions of planning, organizing, implementing, and controlling (Terry & Rue, 2020; Suwatno et al., 2022; Darmanto et al., 2022; Robbins et al., 2024). From a hospital management perspective, healthcare personnel are strategic resources who interact directly with patients; therefore, their competence, professionalism, and interpersonal skills influence how services are received and evaluated by patients (Azwar, 2020; Notoatmodjo, 2021; Ekawaty et al., 2024; Sudirman et al., 2024; Anies, 2023). Human resource competence encompasses the knowledge, skills, abilities, and attitudes that enable individuals to perform their duties effectively and in accordance with established standards (Wibowo, 2023; Sedarmayanti, 2022). These competencies support the achievement of service quality through the dimensions of reliability, responsiveness, assurance, and empathy. When pharmacy personnel possess good competence, patients receive services that are more accurate, prompt, reliable, communicative, and responsive to their needs. This condition increases the congruence between patients' expectations and the services they receive, thereby enhancing patient satisfaction as conceptualized by Kotler & Keller (2022).

The findings of this study are consistent with previous research demonstrating the role of healthcare personnel competence in improving patient satisfaction. Wahyuningtyas et al. (2026) demonstrated that human resource competence and pharmacy service waiting time significantly affected outpatient satisfaction. These findings are further supported by Annisa et al. (2025), who showed that nurses' competence, discipline, and communication had positive and significant effects on patient satisfaction. Meanwhile, Fadilah et al. (2022) and Sukma & Wahyuningsih (2024) showed that service quality, communication, drug availability, and the speed of pharmaceutical services were associated with patient satisfaction. These findings reinforce the results of the present study, indicating that the ability of pharmacy personnel to perform their duties professionally, provide accurate information, communicate effectively, respond to patients' needs, and deliver services in accordance with established procedures can create a positive service experience and increase patient satisfaction.

Thus, Human Resource Competence is one of the factors that supports patient satisfaction through personnel's ability to provide professional, communicative, accurate, and patient-centered services. The better the competence of pharmacy personnel, the greater their ability to meet patients' expectations, thereby increasing satisfaction with services at the Pharmacy Installation of Ryacudu Regional General Hospital, North Lampung.

3.2.4. The Effect of the Drug Management System on Patient Satisfaction

Statistical analysis identified a positive and significant relationship between the Drug Management System (X2) and Patient Satisfaction (Y). The path coefficient reached 0.167, with a t-statistic of $2.421 > 1.96$ and a p-value of $0.016 < 0.05$, providing statistical support for H4. The result suggests that patient satisfaction is partly associated with how effectively the Pharmacy Installation maintains drug availability and organizes pharmaceutical services. Patients are more likely to report favorable service experiences when the required medicines are available, supplied in accordance with prescriptions, maintained in proper condition, and

dispensed accurately. Conversely, drug stockouts or dispensing errors may cause delays and hinder patients from obtaining the therapy they need.

Theoretically, the positive effect of the Drug Management System on patient satisfaction can be explained through management theory, which emphasizes the functions of planning, organizing, implementing, and controlling in managing organizational resources effectively and efficiently (Terry & Rue, 2020; Suwatno et al., 2022; Darmanto et al., 2022; Robbins et al., 2024). In the context of hospital management, drug management is an important component of the healthcare delivery system because medications are one of the main components of patient treatment and therefore need to be managed in a planned and sustainable manner (Azwar, 2020; Notoatmodjo, 2021; Ekawaty et al., 2024; Sudirman et al., 2024; Anies, 2023). Furthermore, applied theory explains that optimal drug management through planning, procurement, storage, distribution, utilization, and monitoring can ensure drug availability and support the smooth delivery of pharmaceutical services (Mulyanti et al., 2023; Rumangkang et al., 2023). This condition is related to the reliability and responsiveness dimensions of service quality because drug availability and accuracy in the service process enable patients to receive consistent, timely, and needs-oriented services. Meeting these needs can increase the congruence between patients' expectations and the services they receive, thereby promoting satisfaction (Kotler & Keller, 2022).

The findings of this study are consistent with Mulyanti et al. (2023), whose study identified the need to strengthen drug management practices, particularly during the planning, procurement, and distribution stages, to support more effective implementation. Rumangkang et al. (2023) also found that several drug management indicators did not meet established standards, indicating the need for improvement strategies. Daeli et al. (2024) showed that drug management is influenced by human resources, infrastructure, funding, and management systems that support the smooth delivery of services. Sukma & Wahyuningsih (2024) also showed that patient satisfaction was associated with service quality, communication, drug availability, and the speed of pharmaceutical services. In addition, Wahyuningtyas et al. (2026) demonstrated that human resource competence and pharmacy service waiting time had significant effects on patient satisfaction, while Pratiwi et al. (2026) showed that aspects of outpatient services were associated with patient satisfaction. These findings reinforce the results of the present study, indicating that effective drug management can support drug availability, facilitate service delivery, and reduce obstacles and waiting times, enabling patients to receive services more accurately and in accordance with their needs.

Thus, the Drug Management System is one of the factors that supports patient satisfaction. Effective management, from planning through monitoring, can ensure drug availability and facilitate the service process, thereby better meeting patients' needs and improving their service experience. These conditions ultimately contribute to increased patient satisfaction at the Pharmacy Installation of Ryacudu Regional General Hospital, North Lampung.

3.2.5. The Effect of Service Quality on Patient Satisfaction

The results showed that Service Quality (Z) had a positive and significant effect on Patient Satisfaction (Y), with a path coefficient of 0.556, a t-statistic of $8.127 > 1.96$, and a p-value of $0.000 < 0.05$; therefore, H5 was supported. This path coefficient was the largest among all direct relationships in the model, indicating that Service Quality had the strongest direct relationship with Patient Satisfaction. Descriptively, Service Quality had a mean score of 3.64 and was categorized as good. Respondents perceived that pharmaceutical services were supported by a reasonably comfortable service area, professional staff appearance, accurate service delivery, responsiveness to patients' needs, the ability to provide medication information, and polite and courteous attitudes. This finding indicates that patient satisfaction is determined not only by the medications received but also by a service process that is prompt, accurate, responsive, safe, and aligned with patients' needs.

According to management theory, planning, organizing, implementing, and controlling are important functions for achieving organizational objectives effectively and efficiently (Terry & Rue, 2020; Suwatno et al., 2022; Darmanto et al., 2022; Robbins et al., 2024). From a hospital management perspective, service quality is one of the indicators of successful healthcare delivery because patients evaluate not only the outcomes of services but also the processes and experiences they encounter while receiving care (Azwar, 2020; Notoatmodjo, 2021; Ekawaty et al., 2024; Sudirman et al., 2024; Anies, 2023). Service quality theory explains that service quality is reflected through five dimensions, namely tangibles, reliability, responsiveness, assurance, and empathy. Services supported by adequate facilities, delivered accurately and consistently, provided responsively, accompanied by reliable information, and attentive to patients' needs can form positive perceptions of the service. When the services received meet or exceed patients' expectations, patient satisfaction increases (Tjiptono & Chandra, 2022; Kotler & Keller, 2022).

The present findings are supported by several previous studies. Fadilah et al. (2022), who found that pharmaceutical service quality was significantly associated with patient satisfaction, while Sukma & Wahyuningsih (2024) identified service quality, communication, drug availability, and service responsiveness as factors related to patient satisfaction. Ardiansyah & Azmi (2023) also demonstrated a significant relationship between medication service waiting time and patient satisfaction, highlighting the importance of service speed in shaping patients' experiences. Furthermore, Wahyuningtyas et al. (2026) showed that human resource

competence and pharmacy service waiting time affected patient satisfaction, which subsequently influenced patient loyalty. Krestopi et al. (2025) also demonstrated that healthcare service quality affected patient satisfaction, while Pratiwi et al. (2026) reported an association between service quality, tariff value, and patient loyalty through patient satisfaction. These findings reinforce the results of the present study, indicating that services that are prompt, accurate, responsive, reliable, and capable of meeting patients' needs can create a more positive service experience.

Thus, Service Quality is an important factor in improving Patient Satisfaction and represents the strongest direct relationship in the research model. Improving service quality through accuracy, promptness, responsiveness, provision of accurate information, and professional and empathetic staff attitudes can increase the congruence between patients' expectations and the services they receive, thereby supporting increased patient satisfaction at the Pharmacy Installation of Ryacudu Regional General Hospital, North Lampung.

3.2.6. The Effect of Human Resource Competence on Patient Satisfaction through Service Quality

The results showed that Human Resource Competence (X1) had an indirect effect on Patient Satisfaction (Y) through Service Quality (Z), with a specific indirect effect of 0.205, a t-statistic of 4.063, and a p-value of 0.000. Because the t-statistic was >1.96 and the p-value was <0.05 , H6 was supported. The direct effect of Human Resource Competence on Patient Satisfaction was also significant at 0.184, while the indirect effect through Service Quality was 0.205. These results indicate that Service Quality functions as a partial mediator in the relationship between Human Resource Competence and Patient Satisfaction. Thus, competent pharmacy personnel may contribute to higher patient satisfaction through their direct influence as well as through the improvement of pharmaceutical service quality.

The mediation relationship can theoretically be explained through a theory that positions human resources as a strategic element in implementing organizational functions to achieve objectives effectively and efficiently (Terry & Rue, 2020; Suwatno et al., 2022; Darmanto et al., 2022; Robbins et al., 2024). From a hospital management perspective, healthcare personnel competence is an important foundation for delivering services in accordance with established standards because healthcare personnel are directly responsible for implementing service systems and procedures for patients (Azwar, 2020; Notoatmodjo, 2021; Ekawaty et al., 2024; Sudirman et al., 2024; Anies, 2023). Human Resource Competence, encompassing adequate knowledge, skills, abilities, and work attitudes, enables personnel to provide services professionally (Wibowo, 2023; Sedarmayanti, 2022). These competencies are manifested through service quality, particularly the dimensions of reliability, responsiveness, assurance, empathy, and tangibles. When personnel are competent, services become more accurate, prompt, responsive, reliable, and aligned with patients' needs, thereby increasing the congruence between the services received and patients' expectations and promoting satisfaction (Kotler & Keller, 2022).

The outcomes of this investigation are consistent with earlier research. Fadilah et al. (2022) showed that pharmaceutical service quality was significantly associated with patient satisfaction. Nopita et al. (2024) showed that human resource competence was one of the factors influencing drug management, while Sukma & Wahyuningsih (2024) found that patient satisfaction was associated with service quality, communication, drug availability, and the speed of pharmaceutical services. Furthermore, Wahyuningtyas et al. (2026) demonstrated that human resource competence and pharmacy service waiting time had significant effects on patient satisfaction. These findings support the results of the present study, indicating that personnel competence can contribute to better service delivery, which in turn improves patients' service experiences and satisfaction.

Thus, Service Quality serves as a mechanism linking Human Resource Competence to Patient Satisfaction. Good personnel competence not only provides a direct benefit to patient satisfaction but also improves the quality of the service process received by patients. Therefore, strengthening Human Resource Competence through improvements in knowledge, skills, communication, and professionalism is important for enhancing both Service Quality and Patient Satisfaction at the Pharmacy Installation of Ryacudu Regional General Hospital, North Lampung.

3.2.7. The Effect of the Drug Management System on Patient Satisfaction through Service Quality

The mediation analysis revealed a significant indirect relationship between the Drug Management System (X2) and Patient Satisfaction (Y) through Service Quality (Z). The specific indirect effect was 0.156, with a t-statistic of $3.289 > 1.96$ and a p-value of $0.001 < 0.05$, supporting H7. The direct effect of the Drug Management System on Patient Satisfaction was also significant, with a path coefficient of 0.167, while the indirect effect through Service Quality was 0.156. Thus, Service Quality was found to partially mediate the effect of the Drug Management System on Patient Satisfaction. Accordingly, effective drug management may contribute to higher patient satisfaction through its direct relationship and through the improvement of pharmaceutical service quality.

This mediation relationship can be explained through management theory, which emphasizes the functions of planning, organizing, implementing, and controlling in managing organizational resources effectively and efficiently (Terry & Rue, 2020; Suwatno et al., 2022; Darmanto et al., 2022; Robbins et al., 2024). From a hospital management perspective, the Drug Management System is an integral part of service

management because drug planning, procurement, storage, distribution, utilization, and monitoring support the continuity of patient care (Azwar, 2020; Notoatmodjo, 2021; Ekawaty et al., 2024; Sudirman et al., 2024; Anies, 2023). An integrated drug management system can ensure drug availability, accurate distribution, time efficiency, and continuity of pharmaceutical services (Mulyanti et al., 2023; Rumangkang et al., 2023). These conditions are reflected in the dimensions of reliability and responsiveness, as effective drug management enables services to be delivered accurately, promptly, consistently, and in accordance with patients' needs. Good service quality subsequently increases the congruence between the services received and patients' expectations, thereby promoting satisfaction (Kotler & Keller, 2022; Tjiptono & Chandra, 2022).

The findings of this study are consistent with previous research. Mulyanti et al. (2023) showed that drug management at the planning, procurement, and distribution stages needed to be optimized to ensure effective service delivery. Rumangkang et al. (2023) also found that several drug management indicators did not meet established standards, indicating the need for improvements to support the quality of pharmaceutical services. Daeli et al. (2024) showed that drug management was influenced by human resources, infrastructure, funding, and management systems. Meanwhile, Sukma & Wahyuningsih (2024) found that patient satisfaction was associated with service quality, communication, drug availability, and the speed of pharmaceutical services. Wahyuningtyas et al. (2026) also showed that human resource competence and pharmacy service waiting time affected patient satisfaction. These findings reinforce the results of the present study, indicating that effective drug management can support the smooth delivery of services and subsequently improve patients' service experiences and satisfaction.

Thus, Service Quality serves as a mechanism linking the Drug Management System to Patient Satisfaction. Effective drug management not only ensures drug availability and accuracy but also supports faster, more accurate, and more responsive services. Continuous improvement in drug management and service quality can help meet patients' needs and increase their satisfaction with services at the Pharmacy Installation of Ryacudu Regional General Hospital, North Lampung.

The findings offer several practical considerations for hospital management, particularly in strengthening the performance of the Pharmacy Installation. Enhancing pharmacy personnel competence through ongoing training, improved communication capabilities, and professional development can contribute to better pharmaceutical service delivery. Drug management can also be strengthened by improving the accuracy of needs forecasting, monitoring inventory levels, and utilizing pharmaceutical information systems to minimize stockout risks and promote service efficiency. At the policy level, periodic assessments of service quality and patient satisfaction are important for identifying areas that require improvement and supporting continuous enhancement of pharmaceutical services.

4. CONCLUSION

The study results demonstrate that Human Resource Competence was positively and significantly associated with both Service Quality and Patient Satisfaction. The Drug Management System likewise showed positive and significant relationships with these two outcomes. In addition, higher Service Quality was significantly associated with greater Patient Satisfaction. Furthermore, Service Quality was found to partially mediate the effects of Human Resource Competence and the Drug Management System on Patient Satisfaction, indicating that the competence of pharmacy personnel and effective drug management not only have direct effects on patient satisfaction but also contribute to satisfaction through the provision of more accurate, prompt, responsive, and patient-centered pharmaceutical services. Therefore, improving Human Resource Competence and strengthening the Drug Management System, accompanied by continuous improvement in Service Quality, are important factors in supporting increased Patient Satisfaction at the Pharmacy Installation of Ryacudu Regional General Hospital, North Lampung. Based on these findings, the hospital is recommended to improve the competence of pharmacy personnel through training and professional development, particularly in communication, medication information provision, prescription accuracy, and complaint handling, optimize the Drug Management System, maintain Service Quality and conduct regular evaluations of patient satisfaction. Future researchers may develop this research by incorporating additional variables, increasing the number of respondents, and expanding the study to other research settings.

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