

Analysis of Patient Satisfaction Levels Toward the Implementation of Electronic Prescribing (E-Prescribing) in the Outpatient Department of Jekulo Kudus Community Health Center

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ABSTRACT

Purpose: This study aimed to analyze patient satisfaction with the implementation of electronic prescribing (e-prescribing) in the outpatient department of Jekulo Kudus Community Health Center and to identify the relationship between patient satisfaction and respondent characteristics as well as service-related indicators. It was hypothesized that e-prescribing implementation was associated with a good level of patient satisfaction, although several service attributes still required improvement.

Research Method: This study used an analytical observational method with a cross-sectional design involving 96 outpatients. Data were collected using a questionnaire based on five SERVQUAL dimensions: tangibles, reliability, responsiveness, assurance, and empathy. Data analysis included validity and reliability testing, univariate analysis, bivariate analysis using the Mann-Whitney test, and Importance Performance Analysis (IPA).

Results and Discussion: Patient satisfaction was significantly associated with age, education level, health insurance status, and frequency of visits to the pharmacy clinic ($p < 0.001$), while gender, employment status, and number of medications received were not significantly related ($p > 0.05$). All SERVQUAL dimensions showed high perceived performance scores, indicating generally good satisfaction. However, IPA identified several priority areas for improvement, particularly the clarity of drug information, staff responsiveness, and patient attention.

Implications: The findings indicate that e-prescribing has improved outpatient pharmaceutical services, but continuous efforts are needed to strengthen communication and patient-centered interaction. Further studies should explore system efficiency and long-term patient outcomes.

Keywords: electronic prescribing; patient satisfaction; SERVQUAL; importance performance analysis; outpatient services; community health center.

1. Introduction

Digital transformation in government is becoming increasingly crucial due to the acceleration of technology adoption in various situations that demand effective and efficient public services. The Indonesian government seeks to re-strengthen relationships with communities based on trust and progress through the transition from traditional public services to electronic-based public services (Alvianty et al., 2025). The Ministry of Health has integrated the Health Center Management Information System (SIMPUS) with the Satu Sehat Indonesia platform to improve the efficiency of primary health services, especially in health centers as the front line. A report by the Ministry of Health of the Republic of Indonesia shows an increase in outpatient visits at primary health care facilities, which encourages the need to adopt service innovations, one of which is electronic prescribing (e-prescribing). The application of electronic prescribing (e-prescribing) can minimize the risk of losses due to



misprescription and improve the quality of medical services through reducing errors in drug distribution and administration (Nurkalis & Solikah, 2024).

The implementation of electronic prescribing is part of the national digital transformation program of the Ministry of Health of the Republic of Indonesia which aims to overcome various problems in outpatient services such as long queues, handwriting errors in conventional prescriptions, and delays in taking medications. World Health Organization (WHO) data shows that errors in the treatment process cause the death of one person every day and result in around 1.3 million people being injured every year in the United States (Laksono et al., 2022). A number of reports found in Indonesia show incidents of medical errors. An analysis of 105,171 prescription sheets showed that about 9.5% of them fell into the category of mistreatment. The most common errors are errors in the prescribing process with a proportion of 88.24%, followed by transcribing errors of 7.61%, errors in the actual dispensing error of 4.02%, and errors in administration error of 0.13% (Mahendra, 2021).

E-prescribing offers significant operational benefits in improving the efficiency of pharmaceutical services. The success of its implementation is highly dependent on the acceptance rate and satisfaction of end-users, particularly outpatients. Patient satisfaction is the main indicator of the quality of health services as mandated in Law Number 36 of 2009 concerning Health and Regulation of the Minister of Health Number 4 of 2019 concerning Puskesmas which emphasizes patient-centered care service orientation. A global study conducted by the World Health Organization (WHO, 2021) shows that the adoption of digital technology such as e-prescribing can increase patient satisfaction by up to 35% in developing countries if supported by stable infrastructure, training of health workers, and education to the public. The research conducted by Putri et al. (2025) shows that as many as 86.8% of patients expressed satisfaction with electronic prescription services. Electronic prescriptions are considered to be able to speed up the drug collection process and reduce prescription errors, although some patients still have difficulty understanding the newly implemented system (Zuraidah et al., 2022).

Research on the level of patient satisfaction with e-prescribing is important to identify the advantages and obstacles faced, so that it can be the basis for improving services and developing a system that is more responsive to patient needs. This analysis is expected to be able to provide a comprehensive picture of the impact of the implementation of e-prescribing at the Jekulo Kudus Health Center and show its contribution to improving the quality of outpatient health services. Thorik G and Utus H (2006: 77) explained that quality service is not only delivering or serving but also understanding, understanding, and feeling. The right message delivery will reach heart share while strengthening the position in the mindset of consumers. These two elements play an important role in growing and strengthening consumer loyalty.

2. Literature Review and Hypothesis Development

2.1 Patient Satisfaction

Patient satisfaction is one of the main indicators in assessing the standards of health facilities and the quality of services provided. Low satisfaction rates can affect the number of patient visits which ultimately impacts the profitability of healthcare facilities. Another factor that also affects the level of patient satisfaction is the attitude of employees towards patients, considering that patients' needs tend to increase over time, as well as their expectations for the quality of service received (Suciati et al., 2023). Service is considered satisfactory if it is able to meet customer needs and expectations. Services are



categorized as ineffective and inefficient when the customer's condition is dissatisfied with the services provided (Fajriani et al., 2023). Service quality is one of the crucial aspects in the use of health services. The assessment of the quality of good service is not only seen from the success of physical healing of illness but also includes the attitude, knowledge, and skills of officers in providing services. Communication factors, information delivery, politeness, punctuality, responsiveness, and the availability of adequate facilities and physical environmental conditions are also important parts in assessing the quality of these services (Fajriani et al., 2023). Important aspects that must be considered in service to patients include speed, friendliness, and certainty of drug availability. The quality of service is considered good if it is able to provide fast and precise services, namely the compatibility between the prescription given and the drugs received by the patient or his family (Setyowati et al., 2017).

2.2 Electronic Prescribing

Electronic prescribing system (e-prescribing) is a system that utilizes special software to facilitate the process of prescribing drugs. This system includes various stages ranging from writing a recipe (Prescribing), reading prescriptions for the drug preparation process (Transcribing), preparation to delivery of drugs by officers (Dispensing), the use of drugs by the patient (Administration), as well as the monitoring stage after drug use (Nugraha et al., 2023). E-prescribing It can be defined as an electronic process that allows doctors to digitally create and send prescription requests to service providers, which are then forwarded directly to the pharmacy's computer from the practice location or place of treatment. The implementation of this system eliminates the need to manually write recipes on paper media because all recipe data is entered through a computer device. Electronic prescription delivery is carried out through a secure closed internet network with a user authentication mechanism, i.e. every user who wants to access the system must first go through the authentication process using a username and password or other security methods such as SecureID (Nugraha et al., 2023).

2.3 The Relationship Between Patient Satisfaction and Electronic Prescribing

The implementation of electronic prescribing (e-prescribing) as an independent variable is closely related and positively related to the level of outpatient satisfaction as a bound variable. The implementation of effective and quality e-prescribing, including ease of use, system reliability, and accuracy and speed of prescription services, directly contributes to improving the patient experience in receiving health services. This condition encourages increased patient satisfaction because the treatment process takes place faster, more precisely, and more transparently.

3. Research Method

This study uses an observational analytical method with a cross-sectional approach. The cross-sectional design was chosen because the measurement of the entire variable was carried out at one specific time. This study aims to determine the level of outpatient satisfaction with electronic prescribing services (e-prescribing) and analyze the relationship between outpatient satisfaction levels at the Jekulo Kudus Health Center. Based on this description, the population in this study is all outpatients at the Jekulo Kudus Health Center. The sample used in this study consisted of outpatients who met the inclusion criteria. The data collection method in this study uses questionnaires as the main tool to obtain primary



data. The data analysis in this study includes validity test, reliability test, univariate analysis with descriptive methods, bivariate analysis, and Importance Performance Analysis (IPA). This research has obtained ethical approval from the Health Research Ethics Committee of the University of Muhammadiyah Purwokerto (KEPK-UMP) with registration number KEPK/UMP/214/XII/2025.

4. Results and Discussion

4.1 Analysis Results

4.1.1 Validity and Reliability Tests

The validity test of the questionnaire on 30 respondents at the Jekulo Kudus Health Center, resulted in all question items in this research questionnaire being declared valid with an average result of r calculation on the expectation aspect of 0.9912 and on the reality aspect of 0.7832. The value of r calculated (Corrected Item–Total Correlation) in each question item is greater than the value of r of the table so that it meets the criteria for the validity of r calculation $> r$ table.

The results of the questionnaire reliability test that had been carried out on 30 respondents at the Jekulo Kudus Health Center, obtained a Cronbach's Alpha value of 0.999 in the expectation aspect and 0.972 in the reality aspect. These values show that the research instrument has a very high level of internal consistency. This indicates that each question item in the questionnaire is interrelated and is able to measure research variables consistently.

4.1.2 Respondent Characteristics

Based on the results of the research that has been conducted, the characteristics of the respondents are obtained as follows.

Table 1. Frequency Distribution of Respondent Characteristics

Characteristics		N (96)	Percentage (%)
Age	17-35	55	57.3
	36-55	41	42.7
Gender	Male	18	18.8
	Women	78	81.3
Education	Primary Education	59	61.5
	Higher Education	37	38.5
Jobs	Work	58	60.4
	Not Working	38	39.6

Source: Primary Data, Data Processing Results 2026)

The results of the respondent characteristics test showed that the majority of respondents were aged 17-35 years (57.3%), female (81.3%), poorly educated (61.5%), and working (60.4%).

4.1.3 Quantitative Indicators

Based on the results of the quantitative indicator analysis, it showed that most respondents used BPJS Kesehatan as a cost carrier (87.5%), had an intensity of visits to pharmaceutical service facilities as ≤ 3 times (77.1%), and received less than five types of drugs (92.7%).

Table 2. Frequency Distribution of Respondents' Quantitative Indicators

Quantitative Indicators	N (96)	Percentage (%)	
Health Expense Insurer	BPJS	84	87.5
	NON BPJS	12	12.5
Intensity of Patient Visits	≤ 3	74	77.1
	> 3	22	22.9
Number of Medications Received	< 5	89	92.7
	≥ 5	7	7.3

Source: Primary Data, Data Processing Results 2026

The Relationship between Patient Satisfaction Level with Electronic Prescribing (E-Prescribing) Based on Respondent Characteristics and Quantitative Indicators

4.1.4 Sample Distribution Distribution (Normality Test)

The normality test is used to assess whether the research data is normally distributed as a basis for determining the type of statistical test used in the next stage of analysis. In this study, normality testing was carried out with the Kolmogorov–Smirnov test because the number of respondents exceeded 50 people. The results of the normality test in this study are presented in the following table 3.

Table 3. Normality Test Results Based on Characteristics

Characteristics	N (96)	Significance
Age	17-35	0.000
	36-55	0.000
Gender	Male	0.014
	Women	0.000
Education	Primary Education	0.000
	Higher Education	0.000
Jobs	Work	0.000
	Not Working	0.000

Source: Primary Data, Data Processing Results 2026

The results of the characteristic-based normality test showed that the entire group of variables produced a significance value of less than 0.05, indicating that the data was not normally distributed.

Table 4. Normality Test Results Based on Quantitative Indicators

Quantitative Indicators	N (96)	Significance
Health Expense Insurer	BPJS	0.000
	NON BPJS	0.000
Intensity of Patient Visits	< 3	0.000
	> 3	0.000
Number of Medications Received	< 5	0.000
	≥ 5	0.072

Source: Primary Data, Data Processing Results 2026

The results of the normality test based on quantitative indicators show that most variables have a significance value of < 0.05, which indicates that the data is not normally distributed.

4.1.5 The Relationship Between Patient Satisfaction Levels and E-Prescribing (Mann-Whitney Test)



The Mann–Whitney test is one of the nonparametric statistical tests used to analyze differences in satisfaction levels in ordinal and ratio scale data, with data processing carried out using SPSS software. The results of the Mann–Whitney test in this study are presented in the following table 5.

Table 5. Results of the Relationship Test between Patient Satisfaction Level and Electronic Perception (E-Prescribing) Based on Characteristics

Characteristics	Patient Satisfaction Rate		
	Mean Rank	Percentage (%)	p-value
Age	17-35	29.71	0.000
	36-55	73.71	
Gender	Male	50.03	0.796
	Women	48.15	
Education	Primary Education	61.86	0.000
	Higher Education	27.19	
Jobs	Work	47.07	0.533
	Not Working	50.68	

Source: Primary Data, Data Processing Results 2026

Based on the results of the relationship between patient satisfaction level and electronic prescription based on characteristics, there was a significant relationship between age and education characteristics (p-value 0.000) and no significant relationship between gender and occupation characteristics (p-value > 0.05).

Table 6. Results of the Relationship Test between Patient Satisfaction Level and Electronic Perception (E-Prescribing) Based on Quantitative Indicators

Quantitative Indicators	Patient Satisfaction Rate		
	Mean Rank	Percentage (%)	p-value
Health Expense Insurer	BPJS	44.91	0.000
	NON BPJS	73.63	
Intensity of Patient Visits to the Pharmaceutical Poly	< 3	40.93	0.000
	> 3	73.98	
Number of Medications Received	< 5	48.10	0.616
	≥ 5	53.57	

Source: Primary Data, Data Processing Results 2026

Based on the results of the relationship between patient satisfaction level and electronic prescription based on quantitative indicators, there was a significant relationship between health insurers and the intensity of patient visits to the pharmacy (p-value 0.000) and there was no relationship in the indicator of the number of drugs received (p-value > 0.05).

4.1.6 Factors Affecting Patient Satisfaction

The results of the study showed that patient satisfaction with the implementation of e-prescribing in the outpatient clinic of the Jekulo Kudus Health Center was influenced by several factors measured based on five dimensions of service quality, namely physical evidence (tangibles), reliability (reliability), responsiveness (responsiveness), assurance (assurance), and empathy (empathy). The assessment of

each dimension was obtained from the average score of patient satisfaction perception based on the questionnaire that had been filled out by the respondents.

Table 7. Average Patient Satisfaction Score on the Implementation of Electronic Prescribing (E-Prescribing) Based on the SERVQUAL Dimension

Yes	Indicator	Average statement value (X)	Average expectation value (Y)
<i>Tangibles (Physical Means)</i>			
1.	Officers dressed modestly and neatly	4.50	4.91
2.	Patient waiting room is clean, comfortable, and well-maintained	4.53	4.91
3.	Seating and garbage disposal are available adequately	4.53	4.91
4.	Facilities for patients are available, such as drinking water and reading brochures	4.38	4.87
5.	Physical proof of prescription service (queue number and medication etiquette) is clear and easy to understand	4.44	4.87
<i>Reliability</i>			
6.	Medication collection services are carried out according to a predetermined schedule	4.47	4.90
7.	Officers rarely make mistakes in e-prescribing services	4.50	4.91
8.	The explanation of the drug information provided by the officer is complete according to the patient's needs	4.44	4.90
9.	The officer's explanation remained clear and consistent when the patient asked again about the use of the drug	4.41	4.90
10.	Errors in drug service are rare so patients do not need to return to the pharmacy counter	4.45	4.91
<i>Responsiveness</i>			
11.	Pharmacists serve patients quickly	4.47	4.89
12.	Pharmacists immediately help when patients need help	4.48	4.89
13.	The pharmacist immediately gave an explanation when the patient asked	4.47	4.89
14.	Pharmacists respond quickly to patient complaints related to drug services	4.45	4.89
15.	Patients do not wait too long to take the drug in the pharmacy section	4.51	4.89
<i>Insurance (Guarantee)</i>			
16.	Pharmacy officers are polite and trustworthy in providing services	4.50	4.87
17.	The pharmacist double-checks the patient's identity (name and address) listed in the electronic prescription (e-prescribing) when handing over the medicine	4.43	4.86
18.	Pharmacists hand over medicines according to the patient's needs contained in electronic prescriptions (e-prescribing)	4.46	4.86
19.	Medication delivered to the patient in good condition	4.42	4.85
20.	Pharmacists master the knowledge of the drugs administered	4.40	4.85
<i>Empathy</i>			
21.	Pharmacists serve patients with a friendly and attentive manner	4.57	4.91
22.	Pharmacists provide patients with the opportunity to submit questions or complaints about medications	4.40	4.91
23.	The pharmacist is willing to explain again if the patient does not understand the explanation of the drug	4.54	4.89
24.	Pharmacists serve all patients fairly without discriminating against each other	4.55	4.89
25.	The pharmacist adjusts the explanation of the drug to the patient's condition	4.46	4.90

Source: Primary Data, Data Processing Results 2026



Based on the analysis of the average patient satisfaction score on the implementation of electronic prescription, the highest average score on the tangibles dimension was obtained in the aspects of cleanliness and comfort of physical facilities and the availability of supporting facilities, with a reality value of 4.53 and an expectation of 4.91. The reliability dimension showed the highest value in the aspect of minimal electronic prescription service errors (reality 4.50; expectation 4.91). In the responsiveness dimension, the highest score was related to the short waiting time for medication intake (reality 4.51; expectation 4.89). The assurance dimension obtained the highest score in the aspects of politeness and trust towards pharmacists (reality 4.50; expectation 4.87). Meanwhile, the empathy dimension had the highest score compared to other dimensions, namely 4.57 in reality and 4.91 in expectations, which reflected the friendly and attentive service of the pharmacist to the patient.

4.1.7 Analysis of Patient Satisfaction Level with the Implementation of E-Prescribing Based on Importance Performance Analysis (IPA)

The results of the Importance Performance Analysis (IPA) analysis showed that the level of patient satisfaction with the implementation of electronic prescribing (e-prescribing) in the outpatient care of the Jekulo Kudus Health Center was divided into four quadrants, namely main priority, maintaining achievement, low priority, and excessive. This mapping is carried out based on a comparison between the level of importance and the level of service performance perceived by patients.

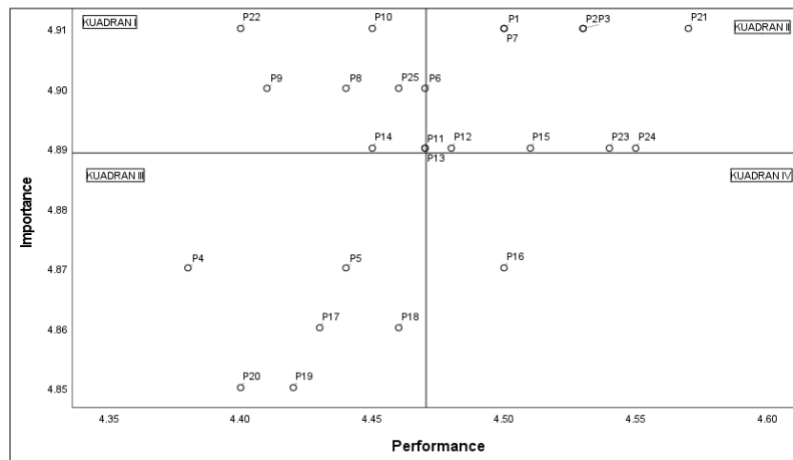


Figure 1. Importance Performance Analysis (IPA) Results

Based on the results of the Importance Performance Analysis (IPA), the highest number of service attributes are in Quadrant I and Quadrant II.

4.2 Discussion

4.2.1 Respondent Characteristics

The results of the study in Table 1 Frequency Distribution of Respondent Characteristics, show that the number of respondents involved in this study is 96 people. All respondent data was declared valid and there was no missing value in all respondent characteristic variables including age, gender, education level, and employment status.

Based on Table 1 Frequency Distribution of Respondent Characteristics, the age grouping of respondents was divided into two categories according to the inclusion criteria of the study, namely 17–35 years old and 36–55 years old. The results showed that the respondents were dominated by the age group of 17–35 years old by 57.3%, while the age group of 36–55 years old by 42.7%. This is in line with the research conducted Dharmayati et al., (2025) which states that individuals in the productive age group tend to be more active in seeking medical help when experiencing health complaints. Individuals in this age range generally have good cognitive abilities, are able to adapt to various situations, and have higher awareness in maintaining health conditions independently. The communication process between pharmacists and patients in this age group also tends to run more effectively, so that the delivery of information related to drug use can be better received and understood by patients.

The characteristics of the respondents in the gender variables in this study were dominated by women by 81.3%, while male respondents were 18.8%. These findings are in line with various studies in the field of health services that show that women use health services more often than men, especially in prescription services and pharmaceutical consultations. Women tend to have a higher level of awareness and attention to personal health conditions, so they are more active in seeking health services and making prevention and treatment efforts than men (Dharmayati et al., 2025).

The last education of the respondents was most in the low category (Elementary - Junior High School), which was 61.5%, while 38.5% was in the higher education category (High School - Higher Education). An individual's level of education plays an important role in shaping a mindset, critical thinking skills, and how to evaluate a service. Respondents with higher levels of education tend to have a deeper understanding of health information, service procedures, and their rights as patients (Yasa et al., 2025).

Based on employment status, 58 respondents (60.4%) were employed, while respondents who did not work were 38 people (39.6%). Employment status as part of socioeconomic status plays an important role in determining access to and utilization of health services. Research shows that socioeconomic factors such as employment, education, and income significantly affect an individual's ability to access health facilities as well as needed health services, including basic health care utilization behaviors (Mutmainnah & Arifin, 2025).

4.2.2 Quantitative Indicators

Based on Table 2 of the Frequency Distribution of Causative Indicators, it shows that the total number of respondents who participated in this study was 96 people. All respondent data were declared complete and worthy of analysis, without finding any missing value in each quantitative indicator variable, which included health insurers, frequency of patient visits to pharmaceutical polyclinics, and the number of drugs received by patients.

Quantitative indicators of health cost insurers show that 87.5% of respondents use BPJS as a health expense carrier, while 12.5% of non-BPJS patients are not BPJS. This shows the dominance of national health insurance in the use of polypharmaceutical services. The National Health Insurance (JKN) program through BPJS Kesehatan has increased public access to primary health services without the burden of direct costs when services are provided (Suzalin et al., 2025). As stated in Presidential Regulation Number 59 of 2024, every Indonesian resident is required to participate in the health insurance program (Perpres, 2024).

The intensity of patient visits to the pharmaceutical polyclinic showed that most of the respondents had a frequency of visits of less than three times, namely 74 people (77.1%), while



respondents with more than three visits amounted to 22 people (22.9%). These results show that most patients do not have a high frequency of visits to the pharmacy. These findings are in line with Warti et al. (2025) which states that the frequency of low visits is generally related to services for acute cases rather than long-term therapy.

Based on the number of drugs received, the majority of respondents received less than five types of drugs, namely 89 people (92.7%), while respondents who received five or more types of drugs amounted to 7 people (7.3%). These findings show that most patients receive drug therapy in relatively small amounts, which are generally related to mild to moderate disease conditions as well as first-level health services that focus on basic case management (Zairina, E., et al, 2024).

4.2.3 The Relationship between Patient Satisfaction Level with Electronic Prescribing (E-Prescribing) Based on Respondent Characteristics and Quantitative Indicators

4.2.3.1 Analysis of the Relationship between Patient Satisfaction Level with Electronic Prescribing (E-Prescribing) Based on Age Characteristics

Based on the results of statistical analysis using the Mann-Whitney test, a p-value of 0.000 was obtained. The results showed that the p-value < 0.05 which showed a significant relationship between the level of patient satisfaction with the age group of 17–35 years and 36–55 years. The 36–55 year old age group had a higher average satisfaction rank than the 17–35 year old age group.

The results of this study are in accordance with the research conducted by Poppy et al., (2025) which states that there is a significant relationship between age and patient satisfaction is characterized by a p-value of 0.000. A patient's age can affect satisfaction levels as it relates to differences in experience, expectations, and the ability to understand health information. Adult patients tend to be more able to assess services carefully, while younger patients often have higher expectations.

4.2.3.2 Analysis of the Relationship between Patient Satisfaction Level with Electronic Prescribing (E-Prescribing) Based on Gender Characteristics

The results of statistical analysis using the Mann-Whitney test obtained a p-value of 0.796. The results showed that the p-value was > 0.05 which showed that there was no significant relationship between the level of patient satisfaction and the gender characteristics of male and female respondents.

Gender did not show a significant association with patient satisfaction, as satisfaction was more influenced by the quality of service, the effectiveness of officer communication, and the fulfillment of health needs, which were relatively the same for all patients regardless of gender. Previous research has shown that gender does not always correlate significantly with patient satisfaction with pharmaceutical services. Research at the Gamping 2 Health Center, Sleman, found that the gender variable was not related to patient satisfaction with pharmaceutical services ($p > 0.05$) (Syahyeri et al., 2025). A similar thing was also reported by a study at the Kartasura Health Center, which showed no significant relationship between gender and patient satisfaction ($p = 0.795$) (Octaviani et al., 2024). Research at RSIA X Bekasi City, also confirmed this finding, namely the absence of a significant relationship between gender and satisfaction with pharmaceutical services ($p = 0.340$) (Laughter) et al., 2025). Research conducted by Rosnarita et al., (2023) It also showed that there was no statistically significant difference in sex distribution between male and female patients ($p\text{-value} > 0.05$).



4.2.3.3 Analysis of the Relationship between Patient Satisfaction Level with Electronic Prescribing (E-Prescribing) Based on Educational Characteristics

Based on the results of statistical analysis using the Mann-Whitney test, a p-value of 0.000 was obtained. The data results showed that the p-value < 0.05 which showed a significant relationship between the level of satisfaction of respondents with low education (SD-SMP) and higher education (SMA-Tertiary). Respondents with low education (SD-SMP) had a higher mean rank of satisfaction compared to respondents with higher education (SMA-Tertiary).

The level of patient education is one of the factors that can affect satisfaction with health services. Previous research has shown a significant relationship between these two variables. At Prabumulih City General Hospital, a meaningful relationship was found between education level and patient satisfaction ($p = 0.021$), where patients with higher education levels had different satisfaction than patients with lower education levels (Diane et al., 2025). Patients with higher levels of education tend to have higher expectations of health care, as their ability to understand medical information, compare services, and be aware of patients' rights makes them more critically assess the quality of care.

4.2.3.4 Analysis of the Relationship between Patient Satisfaction Level with Electronic Prescribing (E-Prescribing) Based on Job Characteristics

The results of statistical analysis using the Mann-Whitney test obtained a p-value of 0.533. The results showed that the p-value was > 0.05 which indicates that there is no significant relationship between the level of patient satisfaction with the type of work, both working and non-working. This is in accordance with research conducted by (Syahyeri et al., 2025), obtained a value p-value 0.312 ($p > 0.05$). Patients' employment status did not show a significant association with satisfaction, as health care was relatively the same for all patients regardless of occupation.

4.2.3.5 Analysis of the Relationship between Patient Satisfaction Level with Electronic Prescribing (E-Prescribing) Based on Quantitative Indicators of Health Cost Insurers

Based on the results of statistical analysis using the Mann-Whitney test, a p-value of 0.000 was obtained. The data results showed that the p-value was < 0.05 which showed a significant relationship between the level of patient satisfaction with the health cost payers in BPJS and non-BPJS users. Non-BPJS respondents had a higher mean rank of satisfaction than respondents using BPJS.

This difference is supported by previous studies that discussed the satisfaction of BPJS and non-BPJS patients in the context of health services. Research at Siti Rahmah Islamic Hospital Padang found a significant difference in the quality of outpatient services ($p = 0.001$), where non-BPJS patients reported higher satisfaction. This is likely due to simpler administrative procedures for non-BPJS patients, shorter waiting times, and greater service flexibility, so that the experience of non-BPJS patients tends to be more satisfying than BPJS patients who have to go through more complex administrative and regulatory processes (Erlinengsih & Angraini, 2025).

4.2.3.6 Analysis of the Relationship between Patient Satisfaction Level with Electronic Prescribing (E-Prescribing) Based on Quantitative Indicators of Patient Visit Intensity to Pharmaceutical Poly



The results of statistical analysis using the Mann-Whitney test obtained a p-value of 0.000. The results showed that the p-value < 0.05 which indicates a significant relationship between the level of patient satisfaction and the intensity of the patient's visits to the pharmacy polyclinic with less than three times and more than three times. Respondents with more than three times the intensity of visits had higher levels of satisfaction.

These findings are in line with Molla et al. (2025) which states that the frequency of visits has a positive effect on patient satisfaction. Palongko et al. (2024) also reported that the quality of pharmaceutical services is related to increased satisfaction and the potential for repeat visits, so that more frequent interaction with pharmaceutical services can strengthen the perception of patient satisfaction. The frequency of these visits also contributes to the formation of patient satisfaction.

4.2.3.7 Analysis of the Relationship between Patient Satisfaction Level with Electronic Prescribing (E-Prescribing) Based on Quantitative Indicators of the Number of Drugs Received

Based on the results of statistical analysis using the Mann-Whitney test, a p-value of 0.616 was obtained. The results showed that the p-value was > 0.05 which indicated that there was no significant relationship between the level of patient satisfaction and the number of drugs received who received less than five types of drugs and five types of drugs or more.

These results are in line with findings in several pharmaceutical service studies, which show that indicators related to the number of drugs do not always correlate significantly with patient satisfaction. A review of five pharmaceutical service articles showed that patient satisfaction tended to be more influenced by the clinical context, the quality of the officer's communication, and the overall experience in the service, rather than simply the number of medications received. This confirms that non-drug factors often have a more dominant role in determining patient satisfaction levels (Wulandari, Retno. 2023).

4.2.4 Factors Affecting Patient Satisfaction

Table 9 Average Patient Satisfaction Score for the Implementation of Electronic Prescribing (E-Prescribing) Based on the SERVQUAL Dimension, it is known that the level of outpatient satisfaction at the Jekulo Kudus Health Center is influenced by the quality of pharmaceutical services which is measured through five dimensions, namely physical evidence (tangibles), reliability, responsiveness, assurance, and empathy (empathy). The average value of reality perception across all dimensions showed relatively high results and was close to the patient's expected value, which indicated that e-prescribing-based pharmaceutical services have run well and are able to meet respondents' expectations.

Dimensions Tangible (physical facilities), the results of the study show that the physical evidence aspect of pharmaceutical services in the implementation of electronic prescribing (e-prescribing) in the outpatient Jekulo Kudus Health Center was assessed well by patients, which is reflected in the relatively high average value of perception of reality on all indicators, such as the neatness of the officers (4.50), the cleanliness and comfort of the waiting room (4.53), the availability of supporting facilities (4.53), and the clarity of physical evidence of prescription services (4.44). The patient's expectation value is still higher than the reality value, this condition shows that the available physical facilities have been able to support the pharmaceutical service process and provide a positive service experience for patients. These findings are in line with research Destya et al., (2023) which states that the quality of physical facilities



and the service environment have a significant effect on patient satisfaction, because physical evidence is an initial indicator in assessing the quality of health services. Dimensions Tangible is one of the important factors that contribute to patient satisfaction in implementation e-prescribing in the first level of health care facilities.

Research results on dimensions Reliability (reliability) indicates that pharmaceutical services are based on electronic prescription (e-prescribing) in the outpatient Jekulo Kudus Health Center was considered good by the patient. This is reflected in the high average value of perception of reality in the indicator of punctuality of medication intake (4.47), the lack of errors in electronic prescription services (4.50), and the clarity and consistency of the explanation of drug information provided by the officer (4.45). Although the reality value is still below the expected value, the difference is relatively small, which indicates that the service has been reliably running and in accordance with the patient's expected standards. The reliability of this service plays an important role in increasing patient trust, because accurate and consistent service can minimize medication misuse and reduce the need for patients to return to the pharmacy counter. These findings are in line with research Annisa et al., (2023) which states that the reliability of pharmaceutical services, especially in the e-prescribing, has a significant effect on patient satisfaction because it is able to improve the accuracy, efficiency, and safety of drug services.

Dimensions Responsiveness (responsiveness), the results of the study show that pharmaceutical services in the implementation of electronic prescription (e-prescribing) in the outpatient Jekulo Kudus Health Center is considered responsive by patients. This is shown by the high average value of perception of reality in the indicator of service speed (4.51), the readiness of officers in helping patients (4.48), the speed of giving explanations (4.47), and the responsiveness in handling complaints related to drug services (4.45). Although the reality value is still slightly below the expected value, the difference is relatively small, indicating that pharmacists have been able to provide fast service and according to the needs of patients. Attendant responsiveness plays an important role in creating comfort and reducing patient wait times, which directly impacts patient satisfaction levels. These findings are in line with research Destya et al., (2023) which states that the speed and responsiveness of pharmacists are important factors in increasing patient satisfaction, especially in electronic system-based outpatient services.

Dimensional research results Insurance (guarantee) indicates that the patient assesses pharmacy services based on electronic prescription (e-prescribing) in the outpatient Jekulo Kudus Health Center has provided a sense of security and good trust. This is reflected in the relatively high average value of perception of reality in the indicators of the officer's polite and trustworthy attitude (4.50), the accuracy of the officer in checking the patient's identity (4.45), the accuracy of the delivery of drugs according to electronic prescriptions (4.46), the condition of the drug (4.42), and the officer's mastery of knowledge about the drugs given (4.40). Although the reality value is still slightly lower than the expected value, the difference indicates that the service has met the standards of safety and professionalism that patients expect. Ensuring good service plays an important role in increasing patient trust in the system e-prescribing and reduce concerns about medication misadministration. Factors Insurance is the dominant aspect in shaping patient satisfaction with service, because it reflects the level of trust, security, and competence of pharmacy officers. Ensuring good service makes patients feel confident that the prescriptions received are appropriate, safe, and professionally managed, thereby increasing satisfaction with the prescription service, especially in the system e-prescribing (Novrianto et al., 2025).



Dimensions Empathy (concern), the results of the study show that pharmaceutical services in the implementation of electronic prescribing (e-prescribing) in the outpatient Jekulo Kudus Health Center is considered very good by patients. This is shown by the high average value of perception of reality on the indicators of friendliness and attention of the officers (4.57), the opportunity for the patient to submit questions or complaints (4.40), the willingness of the officer to repeat the explanation of the drug (4.54), fair service without differentiating the patient (4.55), and the ability of the officer to adjust the explanation of the drug to the patient's condition (4.46). Although the actual value is still slightly lower than the expected value, the difference is relatively small and indicates that pharmacists have implemented patient-oriented services (patient-centered care). The officer's concern in understanding the needs and conditions of patients plays an important role in increasing patient comfort, trust, and satisfaction with the services provided. These findings are in line with research Ganesa et al., (2025) which states that the empathy and good communication of pharmacy officers are important factors in increasing patient satisfaction with pharmaceutical services, especially in electronic system-based services.

The difference between the value of expectation and reality in each dimension illustrates the extent to which the quality of service provided is in accordance with the patient's needs and desires. This condition shows that the implementation of e-prescribing not only plays a role in improving the efficiency and accuracy of pharmaceutical services, but also contributes to increasing patient satisfaction through more structured and systematic services. The five dimensions of SERVQUAL are important factors that together affect the level of patient satisfaction with the implementation of e-prescribing at the Jekulo Kudus Health Center.

4.2.5 Analysis of Patient Satisfaction Level with the Implementation of E-Prescribing Based on Importance Performance Analysis (IPA)

Based on Figure 1 of the Importance Performance Analysis (IPA) results, the level of patient satisfaction with the implementation of electronic prescribing (e-prescribing) in the outpatient Jekulo Kudus Health Center is mapped into four quadrants, namely Quadrant I (main priority), Quadrant II (maintain achievements), Quadrant III (low priority), and Quadrant IV (excessive). This mapping is carried out based on a comparison between the average value of the level of importance (expectation) as the vertical axis and the average value of the level of performance (reality) as the horizontal axis, so that it can illustrate the compatibility between patient expectations and the performance of the services provided.

4.2.5.1 Quadrant I

Quadrant I (top priority) has service indicators that have a high level of importance, but their performance is still below patient expectations. The service attributes in this quadrant have an expectation value in the range of 4.48–4.91 and a reality value in the range of 4.35–4.47. Quadrant I is dominated by the dimensions of reliability, responsiveness, and empathy, which are closely related to communication aspects, clarity of drug information, and attention of pharmacists to patients. The clarity and consistency of the explanation of drug information and the lack of service errors contained in the reliability dimension, show that the reliability of prescription services is an important factor in shaping patient satisfaction. The responsiveness dimension emphasizes that the responsiveness of the officers in providing explanations and handling patient complaints also increases patient comfort and satisfaction with prescription services. In the empathy dimension, giving patients the opportunity to



submit questions and adjusting drug explanations to the patient's condition reflects patient-oriented services.

Previous research has shown that the clarity of drug information, the responsiveness of the officers, and the polite and empathetic attitude of pharmacy officers have a significant effect on patient satisfaction with prescription services based on electronic prescriptions (e-prescribing). Study (Alqurashi et al., 2024) prove that patient satisfaction with e-prescribing Improved when service is accompanied by clear communication, quick response, and a sense of security from pharmacists. Similar findings were reported by International Journal of Medical Informatics (2024) which emphasizes that the quality of officer interaction is a key factor in the success of implementation e-prescribing. In Indonesia, (Putri, H., 2024) also found that the reliability, responsiveness, and Insurance significantly related to patient satisfaction in electronic prescription services.

4.2.5.2 Quadrant II

Quadrant II (maintain achievement) contains service indicators that have an equally high level of importance and level of performance. The service attributes in this quadrant have an expectation value in the range of 4.48–4.91 and a reality value in the range of 4.47–4.60. These attributes include the tangible, reliability, responsiveness, and empathy, which shows that the comfort of physical facilities, the reliability of prescription services, the responsiveness of the officers, and the attitude of empathy are important factors in shaping patient satisfaction. Neatness of the staff and the comfort of the waiting room (Tangible), timeliness and minimal errors in electronic prescription service (Reliability), speed of service and short lead time (Responsiveness), as well as the friendliness and willingness of the officers in explaining drug information fairly to all patients (Empathy) shows that prescription services are based on e-prescribing has met the main aspects expected of the patient. Previous research has shown that the quality of pharmaceutical services, including the aspects of reliability, responsiveness, and empathy of the officers, has a significant effect on patient satisfaction. Susanto et al., (2021) found that the reliability, responsiveness, assurance, and Empathy has a positive relationship with patient satisfaction, including the application of electronic prescribing systems.

4.2.5.3 Quadrant III

Quadrant III (low priority) has service indicators with a relatively low level of importance and performance. The service attributes in this quadrant have an expectation value in the range of 4.85–4.89 and a reality value in the range of 4.35–4.47. Those attributes include the Tangible and Insurance, which relates to the clarity of physical facilities as well as the assurance of safety and accuracy of prescription services. On the dimensions Tangible, the availability of supporting facilities for patients such as drinking water and reading brochures as well as the clarity of physical evidence of prescription services, including queue numbers and medication etiquette, show that visual aspects and service information play a role in shaping patients' comfort and understanding of prescription services. Meanwhile, in the Insurance, attributes such as re-checking the patient's identity, the accuracy of drug delivery according to electronic prescriptions, good drug conditions, and the mastery of pharmacy officers' knowledge reflect the assurance of safety and professionalism of service. This condition shows that patients pay great attention to the aspects of accuracy and competence of officers in prescribing services, especially in the system e-prescribing. Previous research has shown that the clarity of drug information and the assurance of the safety of pharmaceutical services have a significant effect on patient satisfaction,



because it increases patients' sense of security, trust, and confidence in the accuracy of the drugs received. The study in Makassar concluded that patients place high value on professionalism and safety assurance in pharmaceutical information services, which contributes to patient satisfaction of drug services (Stuart Scott, 2025).

4.2.5.4 Quadrant IV

Quadrant IV (excessive) shows indicators of services with a low level of importance but high performance. The service attributes in this quadrant have an expectation value in the range of 4.85–4.89 and a reality value in the range of 4.47–4.60. The attributes included in this quadrant are pharmacy officers who are polite and trustworthy in providing services that are included in the dimension Insurance (guarantee) shows that the professional attitude of the officer is an important factor in forming trust and satisfaction of patients with prescription services. Patient trust in pharmacists plays a big role in fostering a sense of security, especially in prescription-based services e-prescribing which demands high precision and accuracy. Previous research has shown that politeness, service ethics, and trust in the competence of pharmacists have a significant effect on patient satisfaction, as these aspects increase patients' sense of security and confidence in the accuracy of prescription services. Princess, S. C et al., (2023) found that the Insurance which includes the professional attitude of the officers is a strong predictor of patient satisfaction in the hospital pharmacy installation. Irshan & Wahyuningsih (2025) It also confirms that the communication skills and ethics of pharmaceutical services contribute to patient trust in the service, which ultimately increases satisfaction. The results of the analysis of pharmacists' behavior showed that friendly and polite attitudes were positively correlated with the perception of professionalism and patient satisfaction (Sukkotati et al., 2025).

Overall, the results of the IPA analysis show that the implementation of e-prescribing at the Jekulo Kudus Health Center has provided a good level of satisfaction to patients. This analysis provides a clear picture of the priorities for improvement and service aspects that need to be maintained, so that it can be the basis for the health center in formulating a strategy to improve the quality of pharmaceutical services in a sustainable manner.

5. Concluding Remarks and Recommendation

The implementation of electronic prescribing (e-prescribing) in the outpatient care of the Jekulo Kudus Health Center in general has provided a good level of satisfaction to patients. Patient satisfaction was significantly related to age, education level, health insurance status, and intensity of visits to the pharmacy clinic ($p < 0.001$), while gender, employment status, and number of medications received showed no significant association ($p > 0.05$). The entire dimension of SERVQUAL shows a high average value of reality perception across all dimensions. However, improvements are still needed in service attributes related to reliability, responsiveness, and empathy, especially in the aspects of responsiveness and attention of pharmacy officers.

Statement of Use of Generative AI



During the preparation of this work, the author used ChatGPT to assist in improving clarity and readability of the text. The author reviewed and edited the output and takes full responsibility for the content of the publication.

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