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ADOPTION DIGITAL PHARMACY TECHNOLOGY HEALTHCARE SERVICE IN E-HEALTH

Ratna Yulika Go[1*], Nur Aini[2], Budi Tjahjono[3]
[1*]Department of Informatic Engineering, Faculty of Computer Science, Universitas Esa Unggul, Jakarta, Indonesia. Email: ratna.yulika@esaunggul.ac.id
[2]Department Management, Faculty of Economic and Bussiness, Institut Teknologi dan Bisnis Ahmad Dahlan, Tangerang, Indonesia. Email: aini.nur1969@gmail.com
[3]Department of Informatic Engineering, Faculty of Computer Science, Universitas Esa Unggul, Jakarta, Indonesia. Email: budi.tjahjono@esaunggul.ac.id
*Corresponding author; E-mail addresses: ratna.yulika@esaunggul.ac.id

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Abstract. This study aims to analyze the impact of medication delivery services on patient queues at the Outpatient Pharmacy and evaluate user acceptance of the JUJUGNA online medication delivery service at PKU Muhammadiyah Hospital in Wonosobo. The research method used is quantitative, utilizing questionnaires. The study involved 50 samples, consisting of 23 males and 27 females who received or utilized the online medication delivery service. Data was collected through questionnaires to assess the effectiveness, patient satisfaction, and the impact of the service on the efficiency of drug distribution in the hospital. The findings indicate that the JUJUGNA online medication delivery service provides convenience for patients by enabling faster access to medications and reducing queues at the pharmacy. Additionally, patient satisfaction with this service is remarkably high, with positive responses regarding the ease of ordering and timely delivery. This study recommends that hospitals continue to enhance pharmacy service quality through the adoption of digital technology and expand the implementation of similar systems in other healthcare facilities.

INTRODUCTION

The rapid advancement of information technology in the current era of globalization has significantly influenced various sectors, including healthcare. Society increasingly demands fast, accurate, effective, efficient, and affordable services from both public and private hospitals. As service providers, hospitals are required to continuously improve their services in accordance with Law No. 25 of 2009 on Public Services, which regulates public service standards, including healthcare services, the required service standards and the existence of a public service information system (Ahmad Juan Syahwali et al., 2023). Online medication ordering services, or digital pharmacies, are commonly found in developed countries such as

the United States and Europe. Through online pharmacy services, patients can purchase prescribed medications or over-the-counter drugs online, which are then delivered directly to their homes (Pongtambing & Sampetoding, 2023). By utilizing these services, patients save time as they no longer need to visit a pharmacy and wait in long queues for their prescriptions. In Indonesia, online medication ordering platforms are expanding rapidly, in line with the increasing number of internet users. In 2024, Indonesia's internet users exceeded 221 million, equivalent to approximately 79.5% of the total population (Baudier et al., 2023). The number of internet users in the country continues to grow each year. According to data from the Indonesian Internet Service Providers Association (APJII), the number of internet users in 2024 reached 221.56 million (Erwin Permana et al., 2024).

As more people gain internet access, digital healthcare services, including online medication ordering, become more accessible and frequently used. The rise in internet users presents an opportunity for digital healthcare platforms to reach more consumers. Increasing online connectivity allows users to conveniently purchase medications through apps or websites that offer such services (Lukitawati & Novianto, 2023). Additionally, many people now prefer the convenience of online shopping, including buying medicines, due to easy access, fast delivery, and the ability to compare prices and products. JUJUGNA, an online medication delivery service, is a new innovation in Wonosobo Regency. The name "JUJUGNA" comes from the Javanese language, meaning "deliver." The use of a local language aims to preserve cultural heritage while reinforcing the identity of the local community. The service process includes four key steps: first, filling out a form; second, paying the delivery fee; third, receiving medication education; and fourth, delivering the medication to the patient. The JUJUGNA service is only available for outpatient clinics, with deliveries scheduled three times a day. Prescriptions received from morning until 12:00 PM are delivered at 1:00 PM. Prescriptions received between 12:00 PM and 3:00 PM are delivered at 4:00 PM, while prescriptions received after 3:00 PM until the outpatient clinic closes are delivered the following day at 8:00 AM.

Previous studies have shown that medication delivery services play a crucial role in improving pharmacy service efficiency and patient experience (Evarianti & Kustini, 2023). For example, research conducted by Halodoc found that medication delivery services can reduce waiting times. However, most prior studies have not specifically examined the impact of medication delivery services on reducing pharmacy queues or improving hospital drug distribution efficiency (Munawaroh & Permanasari, 2023). This highlights the need for further research on the impact of the JUJUGNA service at PKU Muhammadiyah Hospital Wonosobo. At PKU Muhammadiyah Hospital Wonosobo, particularly in the pharmacy unit, key aspects such as prescription management, medication supply, and service speed are highly prioritized. High-quality pharmacy services influence patient perception, satisfaction, and overall user experience, which ultimately affects the hospital's service quality. Additionally, hospital management is concerned about the long queues at the outpatient pharmacy, where patients often wait 2-3 hours just to collect their prescriptions. BPJS regulations set a maximum examination time for outpatient visits, and the limited waiting area at the pharmacy

makes the queuing experience uncomfortable. To address these challenges, the idea of a medication delivery service emerged to reduce queues at the outpatient pharmacy.

This study aims to answer the central research question: To what extent does the "JUJUGNA" service enhance patient satisfaction and optimize hospital pharmacy performance? The hypothesis tested is that the JUJUGNA medication delivery service can reduce patient waiting times, improve user convenience, and support efficient pharmacy staff performance in hospitals. Thus, this research seeks to provide deeper insights into the effectiveness of online medication delivery services in a hospital setting and offer recommendations for service improvements. Therefore, this study focuses on the "Evaluation of Pharmacy Services Through the JUJUGNA Online Medication Delivery Service at PKU Muhammadiyah Hospital Wonosobo.

The urgency of this research lies in the growing pressure on healthcare systems especially hospitals to deliver faster, more efficient, and patient-centered services in the digital era. With Indonesia experiencing a sharp rise in internet penetration (over 221 million users in 2024), public expectations for convenient, technology-based healthcare services have increased significantly. At the same time, hospitals such as PKU Muhammadiyah Hospital Wonosobo face operational challenges, particularly long pharmacy queues where patients may wait 2–3 hours to receive medications. This situation not only reduces patient satisfaction but also conflicts with service efficiency standards mandated by Law No. 25 of 2009 on Public Services and BPJS service time regulations. Therefore, evaluating innovative solutions like online medication delivery becomes urgent to address inefficiencies, improve patient comfort, and optimize healthcare service delivery in a rapidly digitalizing society.

The novelty of this research is reflected in its focus on a locally developed, culturally grounded innovation—JUJUGNA online medication delivery service—which integrates digital healthcare with community identity (through the use of Javanese language). Unlike prior studies that broadly discuss digital pharmacies or medication delivery platforms, this research specifically examines the real-world implementation of a hospital-based delivery system and its direct impact on pharmacy queue reduction, workflow efficiency, and patient satisfaction. Furthermore, it fills a research gap by empirically analyzing how such a service affects internal hospital performance, rather than only focusing on user convenience or general adoption of online pharmacies. By evaluating a structured service model with defined delivery schedules and patient education components, this study offers practical and context-specific insights that can inform similar healthcare innovations in other regional hospitals.

METHOD

This research focuses on evaluating hospital pharmacy services through the JUJUGNA online medication delivery service at PKU Muhammadiyah Hospital Wonosobo. The selection of this phenomenon is based on the need to address issues related to long queues and limited patient access to medication at hospital pharmacies. Additionally, as expectations for fast and efficient services increase, this study aims to evaluate how effective the JUJUGNA service is in meeting patient needs and improving the operational efficiency of the pharmacy.

The chosen research method is descriptive analysis with a quantitative approach, which is considered the most suitable for evaluating the impact of this service on patient satisfaction and pharmacy system efficiency while identifying challenges and potential developments for online medication delivery services in a hospital setting.

This study employs a quantitative approach, with data collected through questionnaires focusing on patient satisfaction levels and perceptions of the JUJUGNA service. The questionnaire is designed to gather information about patient experiences and satisfaction. The collected data will be analyzed to identify satisfaction patterns, which will then be used to address the research objectives.

The data sources for this study include patients using the JUJUGNA service, pharmacy staff, and hospital management involved in pharmacy services. Patient sampling is conducted randomly with 50 sample (23 males and 27 females) among service users over a one-month period from November to December 2024. Data is collected using electronic questionnaires distributed to patients. The gathered data is analyzed through a coding process, and the analysis results are integrated to provide a comprehensive overview of the effectiveness and challenges of the JUJUGNA service at PKU Muhammadiyah Hospital Wonosobo. The questionnaires using likert scale 1-4 to know the respond from respondent show in Table 1.

Table 1. Patient Satisfaction Instrument

No.	Question	Source
1	JUJUGNA pharmacy service	(Li et al., 2024)
2	Availability of the medication you need	(Bertoglio & Sehnem, 2024)
3	Ease of the medication ordering process	(Li et al., 2024)
4	Staff provides information clearly and understandable	(Shu & Peng, 2024)
5	Friendliness and professionalism of our courier	(Shu & Peng, 2024)
6	Timeliness of delivery according to the promised schedule	(Shu & Peng, 2024)
7	Quality of medication packaging you received	(Bertoglio & Sehnem, 2024)
8	Responsiveness of customer service when you contact us?	(Bertoglio & Sehnem, 2024)
9	Ease of the payment process	(Li et al., 2024)

10	Assurance of safety and trust in using the service	(Li et al., 2024)

The data analysis method is conducted quantitatively, where the obtained data is analyzed descriptively using percentages. This process involves dividing the number of respondents who answered the question by the total number of respondents surveyed, then multiplying the result by 100%. This allows for determining the percentage of success of the actions taken. The formula used is as follows (Sugiyono in Andriyanto, 2020):

The formula used for descriptive quantitative data analysis with percentages is as follows:

$$TKP = \frac{\sum s}{n} \; x \; 100\% \quad (1)$$

Where:
TKP= Persentase
∑s = Sum of respondent
n = Sum of maximal score

By using this formula, the study can measure the level of patient satisfaction with the JUJUGNA service based on respondents' answers in the questionnaire.

RESULTS AND DISCUSSION

This study employs a descriptive survey approach, with respondents consisting of pharmacy service customers. Data was collected through a questionnaire covering ten key indicators, each assessed under the categories of "Very Satisfied," "Satisfied," "Fairly Satisfied," and "Not Satisfied". Here the results of customer satisfaction in Table 2.

Table 2. Survey Results On Customer Satisfaction

No	Question	Very Satisfied	Satisfied	Fairly Satisfied	Not Satisfied
1	JUJUGNA Pharmacy Service	23	20	7	-
2	Availability of the required medication	21	23	6	-
3	Ease of ordering medication	22	21	6	1
4	Clarity and comprehensibility of information provided by staff	18	24	7	1
5	Friendliness and professionalism of couriers	18	27	5	-

6	Timeliness of delivery according to the promised schedule	17	25	6	2
7	Quality of medication packaging received	17	25	7	1
8	Customer service response when contacted	18	25	7	-
9	Ease of payment process	15	29	6	-
10	Security and reliability in using the service	25	19	6	-

The survey results provide insights into customer satisfaction with the JUJUGNA pharmacy service. A majority of customers (23 "Very Satisfied," 20 "Satisfied," and 7 "Fairly Satisfied") expressed overall contentment with the service. Similarly, medication availability was well-received, with 21 customers reporting being "Very Satisfied," 23 "Satisfied," and 6 "Fairly Satisfied," indicating that most customers' needs were met. However, the ease of ordering medication showed some room for improvement, as while 22 customers were "Very Satisfied" and 21 "Satisfied," 6 were only "Fairly Satisfied," and 1 was "Not Satisfied."

In terms of communication, 18 customers found the information provided by staff to be "Very Satisfied," 24 "Satisfied," 7 "Fairly Satisfied," and 1 "Not Satisfied," highlighting a need for improved clarity. Meanwhile, the friendliness and professionalism of couriers received high marks, with 18 "Very Satisfied," 27 "Satisfied," and 5 "Fairly Satisfied." Delivery timeliness was also mostly positive (17 "Very Satisfied," 25 "Satisfied"), though 6 customers were only "Fairly Satisfied" and 2 were "Not Satisfied," indicating some inconsistencies.

The quality of medication packaging was another key area, with 17 "Very Satisfied," 25 "Satisfied," 7 "Fairly Satisfied," and 1 "Not Satisfied," showing that while feedback was generally positive, consistency in packaging safety should be maintained. The customer service response was rated as "Very Satisfied" by 18 customers, "Satisfied" by 25, and "Fairly Satisfied" by 7, suggesting a need for better speed and accuracy in responses.

Regarding payment ease, 15 customers were "Very Satisfied," 29 "Satisfied," and 6 "Fairly Satisfied," showing a mostly positive experience but with potential for simplification. Lastly, security and reliability in using the service received strong feedback, with 25 "Very Satisfied," 19 "Satisfied," and 6 "Fairly Satisfied," underscoring customer trust as a key strength.

Overall, the survey found that 23% of customers were "Very Satisfied," 67% were "Satisfied," 9% were "Fairly Satisfied," and only 1% were "Not Satisfied." While the service is well-regarded, areas such as communication clarity, delivery consistency, and customer service responsiveness could be refined to further enhance the user experience. The survey results reveal a generally high level of customer satisfaction with the "Jujugna" online medicine delivery service. However, there are still opportunities for improvement, particularly in

aspects such as delivery timeliness, information clarity, and customer service responsiveness. Continuous evaluation and enhancements will be essential in further optimizing service quality and meeting customer expectations.

To strengthen the findings, we can compare them with previous research on pharmacy service satisfaction and online medicine delivery (Regah, 2024). Studies have highlighted key factors that influence customer satisfaction in pharmaceutical services, including service reliability, communication effectiveness, delivery efficiency, and ease of ordering (Khoirunisah et al., 2024). For instance, a study by (Yanti, 2023) examined customer satisfaction in online pharmacy services and found that clear communication from pharmacy staff significantly impacted trust and overall satisfaction. This aligns with the current study, where 18 customers were "Very Satisfied" and 24 were "Satisfied" with the clarity of information, but some still found it lacking. This suggests a universal need for pharmacies to enhance the way they provide medical information. Another study by (Hidayani & Santosa, 2024) discussed timeliness in medicine delivery as a major determinant of customer trust. The current research similarly found that while 67% of customers were satisfied with delivery timeliness, 9% were only "Fairly Satisfied," and 2% were "Not Satisfied." This indicates that while performance is acceptable, improvements in consistency are necessary to align with best practices (Budiyatno, 2022). In comparison with a study on e-pharmacy services in Indonesia (Siti Nur Ainun Nadiyah & Diansanto Prayoga, 2024), which emphasized the importance of customer service responsiveness, the present study echoes similar findings (Junaidi, 2021). Despite a relatively positive rating, there is still room for improvement in response time and service efficiency, which is crucial for retaining customer loyalty (Putri & Mangesti, 2023; Sutabri et al., 2023).

Additionally, previous studies highlight that payment convenience plays a crucial role in user experience in online pharmacy services (- & Diansanto Prayoga, 2024; Cepi Hidayatuloh & Dety Mulyanti, 2023). The current research supports this, as while most respondents found the payment process easy (15 "Very Satisfied," 29 "Satisfied"), there is still an opportunity for further simplification. In conclusion, this study aligns with previous research, reinforcing the importance of clear communication, efficient delivery, responsive customer service, and seamless payment systems in ensuring high customer satisfaction in online pharmacy services (Dwi et al., 2024). However, the findings also indicate that even with high satisfaction levels, there is always room for optimization in these key areas to further enhance user experience (Kesehatan et al., 2023).

CONCLUSION

Based on the survey conducted by the author in evaluating pharmacy services through the JUJUGNA online medicine delivery service at RS PKU Muhammadiyah Wonosobo, the overall results indicate that the majority of customers are satisfied with the service provided (67% satisfied and 23% very satisfied). Only a small portion of customers feel fairly satisfied (9%), and an even smaller percentage are dissatisfied (1%).

Although the service is considered adequate, there are still several aspects that can be improved to enhance customer satisfaction, particularly for those who only feel fairly

satisfied. Improvement efforts should focus on elements that may be less optimal for customers who feel less satisfied or only fairly satisfied. Based on these findings, several recommendations can be implemented to further improve service quality, specifically addressing the aspects that contribute to dissatisfaction or lower satisfaction levels.

1. Conducting further investigation to identify the root causes of dissatisfaction. This could involve interviews or more detailed customer feedback. Are there issues with the product, service, or overall customer experience?
2. Identifying specific problems will help in implementing appropriate corrective measures. Creating easier channels for customers to provide direct and quick feedback, such as regular surveys, suggestion boxes, or social media platforms, will allow for more targeted improvements.

By making improvements in more specific areas and focusing on enhancing the overall customer experience, the company can further increase customer satisfaction, reduce the number of fairly satisfied customers, and create a more satisfying experience for all users

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