

JURNAL ILMIAH MANAJEMEN BISNIS DAN INOVASI
UNIVERSITAS SAM RATULANGI (JMBS UNSRAT)

**THE EFFECT OF PERFORMANCE EXPECTANCY, PERCEIVED NEED,
PERCEIVED VALUE AND PERCEIVED EASE OF USE ON PATIENT
SATISFACTION AND CONTINUANCE INTENTION IN THE HALODOC
TELEMEDICINE SERVICE APPLICATION IN JABODETABEK IN 2023**

Stevani, Innocentius Bernarto

Universitas Pelita Harapan

ARTICLE INFO

Keywords: Telemedicine; halodoc; patient satisfaction; continuance intention

Kata Kunci: telemedis; halodok; kepuasan pasien; niat kelanjutan

Corresponding author:

Stevani

stevanyliang@yahoo.com

Abstract. Telemedicine is a fast-growing solution in healthcare equity efforts, with the most widely used application in Indonesia is the Halodoc app. Despite its great potential, user satisfaction with this application can affect users' continuance intention in using it. This study aims to analyze the impact of performance expectancy, perceived need, perceived value, perceived ease of use, on patient satisfaction and continuance intention of using the Halodoc app. Data from online questionnaires filled in by 312 respondents were collected and analyzed by Structural Equation Modeling method using SmartPLS 4.0. The results showed that expectancy, perceived need, perceived value, and perceived ease of use influence patient satisfaction positively and significantly. Performance expectancy, perceived need, perceived value, perceived ease of use, and patient satisfaction influence continuance intention positively and significantly

Abstrak. Telemedis merupakan solusi yang berkembang pesat dalam upaya pemerataan layanan kesehatan, dengan aplikasi yang paling banyak digunakan di Indonesia adalah aplikasi Halodoc. Meskipun potensinya besar, kepuasan pengguna terhadap aplikasi ini dapat mempengaruhi niat pengguna untuk terus menggunakannya. Penelitian ini bertujuan untuk menganalisis pengaruh ekspektasi kinerja, persepsi kebutuhan, persepsi nilai, persepsi kemudahan penggunaan, terhadap kepuasan pasien dan niat untuk terus menggunakan aplikasi Halodoc. Data kuesioner online yang diisi oleh 312 responden dikumpulkan dan dianalisis dengan metode Structural Equation Modeling menggunakan SmartPLS 4.0. Hasil penelitian menunjukkan bahwa ekspektasi, kebutuhan yang dirasakan, nilai yang dirasakan, dan persepsi kemudahan penggunaan berpengaruh positif dan signifikan terhadap kepuasan pasien. Ekspektasi kinerja, kebutuhan yang dirasakan, nilai yang dirasakan, persepsi kemudahan penggunaan, dan kepuasan pasien mempengaruhi niat melanjutkan secara positif dan signifikan

INTRODUCTION

Health facilities are crucial to improve the level of public health. Hospitals, as health service providers, have an enormous duty to provide quality health services ranging from emergency to inpatient department, in line with operational guidelines set out in Regulation of the Minister of Health of the Republic of Indonesia Number 56 of 2014. Based on the World Bank data, Indonesia has the second lowest number of doctors in Southeast Asia in 2010 – 2017 (0.4 doctors per 1,000 individuals). Limitations in Indonesia's health aspects require innovation to ensure equitable health services for all levels of society (Yulaikah & Artanti, 2022).

Telemedicine, which utilizes technology to provide health services without direct face-to-face contact between doctors and patients, has become a rapidly growing solution in efforts to equalize health services. The Ministry of Health of the Republic of Indonesia and the Indonesian Medical Council have issued regulations and guidelines regarding the implementation of telemedicine. Many telemedicine platforms, such as Halodoc, Alomedika, Alodoc, KlikDokter, Klinik Go, Good Doctor, GetWell, Link Sehat, Mobile JKN, Milvik Dokter dan Grabhealth have emerged that can enable easier access to healthcare services, particularly in minimizing limitations in time and distance (Sunaryo., 2023).

User satisfaction in using telemedicine application services is very important. Satisfaction can be classified into namely functional satisfaction and psychological satisfaction. Functional satisfaction is attained through functionality of the utilized product, whereas psychological satisfaction is attained through attributal utilization of a product which is often intangible (Herwando & Sitompul, 2021). Several factors, including performance expectations, perceived need, ease of utilize, and seen esteem, can impact client fulfillment (Alam et al., 2018).

This study focuses mainly on the use of the Halodoc application, which provides a variety of health services, including online doctor consultations, drive-through vaccinations, specialized care for pregnant women, buying drug prescription and medication delivery. According to the Katadata Insight Center (KIC) survey in 2022, Halodoc is the most utilized telemedicine benefit in Indonesia (Annur, 2022).

Telemedicine has provided superiority in efficient and effective service, including easier consultations with health professionals, variable means of communications through chats, voice, or video. It has also provided convenient monitoring and evaluation as patients no longer need to leave their residences, queue, and wait to meet with health professionals. However, its utilization still has limitations. Diagnosing diseases only through app communication is often inadequate. Furthermore, diseases that require immediate treatment or treatment other than prescribed medications cannot be done. The utilization of telemedicine may also be difficult for the elderly or those living in remote areas with inadequate internet connection (Saputra & Dewi, 2022). In recent years, digital health services have grown rapidly, with the majority of users being satisfied with the services (Ulya, 2019). There are also dissatisfied users, as seen in the low rating of the Halodoc application on Google Play (Praditya et al., 2021). The decline in positive ratings on the Halodoc application in recent years shows a decline in user satisfaction.

Along with this phenomenon, it is critical to analyze the components that influence user satisfaction and continuance intention of the Halodoc application. The aim of this study is to analyze the positive impact of performance expectations, perceived needs, perceived value, ease of use, on patient satisfaction and continuance intention of the Halodoc application in Indonesia in 2023. Therefore, it is expected that the findings of this study will support telemedicine service providers to continue to innovate and ensure continued use of these telemedicine services.

Patient Satisfaction. Patient satisfaction is important in the implementation of telemedicine services, which incorporates how well patients' expectations, objectives, and precedences are met by health service vendors (Huei et al., 2015). It reflects the overall appraisal of the item or benefit and user's experience (Ndubisi, 2018). Expectancy Disconfirmation Theory (EDT) explains how satisfaction or dissatisfaction is formed, by comparing initial expectations with perceptions of product or service performance after use (Lankton et al., 2016). Patient satisfaction is important in the healthcare context and may influence intentions to reuse telemedicine services.

Continuance Intention is a client's deliberate to proceed employing an item or benefit, such as a consumer's decision to make repeat purchases (Chiu et al., 2019). After using it, clients compare their expectations with genuine encounters, and in case the encounter is superior than expectations, they are more possibly to be satisfied and will proceed to utilize the benefit.

Performance Expectancy alludes to an individual's conviction that employing a framework or innovation will assist them in accomplishing what they require more comfortably and productively (Venkatesh et al., 2003 in Alalwan, 2020). Performance expectancy is a key component that impacts a person's intention to utilize technology, particularly within the setting of telemedicine services.

Perceived Need alludes to an individual's evaluation of the requirements or benefits of health services based on their individual perceptions, which then influences their behavior in utilizing these services (Malik et al., 2020). Within the setting of health services, perceived need can influence patient satisfaction and the decision to reuse telemedicine services.

Perceived Value is the client's insight of the gains gotten in return for the penances made in getting a item or benefit (Zeithaml, V. A, 1988). This evaluation impacts customer choices and behavior, and perceived value can be a critical component in keeping up customer loyalty to telemedicine services.

Perceived Ease of Use alludes to an individual's conviction that employing a technology or system does not require much exertion and will make their work more simple (Chuttur, 2009). These components have a solid impact on users' intentions to accept and use information technology, particularly within the setting of telemedicine.

Hypothesis Development

Using information technology in the health sector, performance expectancy is a key factor in increasing user satisfaction. Research by various researchers such as Wei et al. (2020), shows that the belief that the technology can help users in their daily activities contributes positively and significantly to the level of user satisfaction.

H1: Performance expectations has a positive effect on patient satisfaction

Perception of health needs (perceived need) involves assessing health conditions, pain levels, and fear of illness, which collectively prompt individuals to feel the need to utilize telemedicine services (Mallampati et al., 2021). Moreover, research by Wen & Gustafson, (2004) noted the significance of the relationship between health needs, fulfillment with care, and quality of life in cancer patients. Client fulfillment, on the other hand, reflects the degree to which the items or administrations advertised by the company can meet or indeed surpass client desires. This will be an pointer in overseeing and moving forward commerce.

H2: Perceived need has a positive effect on patient satisfaction

Perceived Value based on customers' recognitions of what they gotten compared to what they were given, such as the price or the sacrifices they made. When customers feel that they are getting high

value in relation to what they paid for or were provided, this will increase their satisfaction with their purchase or experience (Petrick, 2004; Caruana et al., 2000). A study by Suryadana, (2017), found that perceived value contributes positively to patient satisfaction, and patient satisfaction has an important role in building long-term relationships. Hence, the level of satisfaction increases if the perceived value exceeds patient expectations, which in turn can influence patient loyalty in the long term.

H3: Perceived value has a positive effect on patient satisfaction

Perceived ease of use is an important concept in the TAM (Technology Acceptance Model), which is utilized to recognize the association between perceived ease of use and computer self-efficacy. Results of a study by Hidayat & Winarno, (2014) was ease of utilize contributes emphatically and essentially to client satisfaction. Ashghar & Nurlatifah, (2020) also found similar results on electronic satisfaction (E Satisfaction).

H4: Perceived ease of use has a positive effect on patient satisfaction

Perceived ease of use was found to have a positive relationship with intention to utilize mHealth services in a study by Alam et al., (2018). Furthermore, it is also associated to the real use of mHealth services. Similar results were also found in research Zhao et al., (2018), which shows that perceived ease of use positively impacts individuals' intentions to utilize health information technology.

H5: Perceived ease of use has a positive effect on Continuance intention

Satisfaction with technology use refers to the extent of satisfaction felt by users in interacting with technology. Research has also shown that the level of satisfaction is positively associated with intensity of use, as found in research by DeLone & McLean, (2003). Hsiao et al., (2016) emphasizes that satisfaction together with continuity intention are key factors in maintaining loyal relationships with users. User satisfaction is considered an important factor in determining users' continuance intention in using an information system, which reflects whether they will continue using or seek to improve their skills in using the information system. In other words, when users feel satisfied with the experience of using an information system, they tend to be more inclined to continue using the information system in the future.

H6: Patient satisfaction has a positive effect on Continuance intention

Performance expectations refers to the more convenient and productive benefits that a new system or application provides to users (Venkatesh et al., 2003). Research by Chou et al., (2010) which uses Expectation-Confirmation Theory (ECT) appears that there's a positive relationship between online community members' expectations and intentions in contributing. This means that if individuals believe that participating in an online community will improve their performance, then they are likely to continue participating in the community to create knowledge. Research by Alviani et al., (2023) within the setting of appropriation of telemedicine administrations for virtual health services in Indonesia, it was found that performance expectancy has a positive influence on users' intention to use telemedicine services. Moreover, Alam et al., (2018) demonstrated that performance expectancy has a positive impact on intention to use mHealth services, and this intention to utilize mHealth also significantly impacts the real utilization of mHealth. Common findings were found in a study by Hutabarat et al., (2021), which further affirmed that performance expectancy has a positive influence on continuance intention.

H7: Performance Expectancy has a positive effect on Continuance Intention

Based on the hypothesis above, below is the proposed research model.

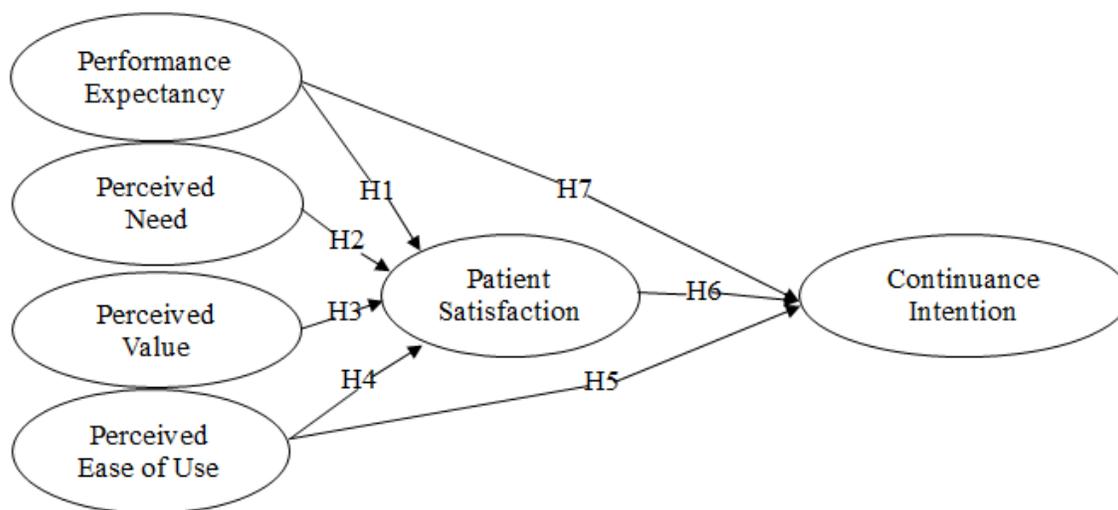


Figure 1. Research Model

RESEARCH METHODOLOGY

This research method involves a survey by distributing online questionnaires to users of the Halodoc Mobile Telemedicine application in the Jabodetabek area. The variables studied were Performance Expectancy, Perceived Need, Perceived Value, Patient Satisfaction, Perceived Ease of Use, and Continuance Intention. The total sample of 100 respondents was selected using the Cochran formula. Data were analyzed using SEM (Structural Equation Modeling) with a PLS (Partial Least Square) approach. Before the main survey, a validity and reliability test of the instrument was carried out, with results that met the requirements.

Results and Discussions

Respondent Profile. Of the 312 respondents who met the research criteria, the majority were women (59.62%) and aged 18-26 years (57.76%). Most of them live in Jakarta (36.54%) and have a Bachelor's degree (66.03%). In terms of employment, the majority are private employees (32.05%). Most have income between 1,000,000 to 5,000,000 (37.82%). In using the Halodoc application in the last 6 months, the majority used the application more than 3 times (35.58%).

Table 1. Characteristics of Research Subjects

Profile	Category	Number of Respondents	Percentage (%)
Gender	Woman	186	59.62%
	Man	126	40.38%
Age	18-26 Years	149	57.76%
	27-42 Years	135	43.27%
	> 43 Years	28	8.97%
Domicile	Jakarta	114	36.54%
	Bogor	38	12.18%
	Depok	35	11.22%
	Tangerang	90	28.85%
Last education	Bekasi	35	11.22%
	Elementary School	1	0.32%
	Junior High School	4	1.28%

	Senior High School	58	18.59%
	D3	22	7.05%
	S1	206	66.03%
	S2	21	6.73%
	Student/Students	40	12.82%
	Private employees	100	32.05%
	Government employees	21	6.73%
Work	Professional	23	7.37%
	Housewife	44	14.10%
	Self-employed	81	25.96%
	Freelancing	2	0.64%
	Doesn't work	1	0.32%
	≤ 1,000,000	51	16.35%
Income	1,000,000 - 5,000,000	118	37.82%
	5,000,000 - 10,000,000	100	32.05%
	≥ 10,000,000	43	13.78%
	1 time	70	22.44%
Use of the Halodoc application in the last 6 months	2 times	73	23.40%
	3 times	58	18.59%
	> 3 times	111	35.58%

Outer model. In this research, the validity and reliability of the outer model was tested using SmartPLS 4.0 software. From the results of the outer model testing, there were 28 indicators used in the research, and each indicator shows value of >0.70 . Convergent validity test using AVE (Average Variance Extracted), which shows that the AVE for each variable >0.5 . Discriminant validity testing using the HTMT (Heterotrait-monotrait ratio) method shows that each variable in the study has an HTMT correlation <0.900 . Next, in the outer model analysis, construct reliability testing was carried out by utilizing Cronbach's alpha and composite reliability, which show a high level of consistency and values >0.7 . All indicators are valid (outer loading value >0.7) and variable-valid (AVE >0.5). Discrimination testing shows that the research variables are different from each other. Thus, all variables used in this research are considered reliable. (Table 2)

Table 2. Discrimination Validity Test Results-HTMT

	CI	P.E	PEOU	PN	PS	PV
CI						
P.E	0.807					
PEOU	0.779	0.782				
PN	0.836	0.838	0.688			
PS	0.892	0.807	0.770	0.836		
PV	0.820	0.845	0.806	0.872	0.875	

Table 3. Reliability Testing Results

Variable	Cronbach's (>0.7)	Alpha	Composite (>0.7)	Reliability	Information
P.E	0.936		0.949		Reliable
PN	0.907		0.935		Reliable
PV	0.924		0.946		Reliable
PEOU	0.950		0.962		Reliable
PS	0.943		0.959		Reliable
CI	0.921		0.950		Reliable

Table 3 concludes that all of the utilized factors are dependable. This is reflected by the Cronbach's alpha and composite reliability values >0.7 , which suggest the factors utilized in this test are dependable factors.

Structural Models. A structural model is something that is produced by testing the determinant coefficient (R² value), collinearity test (Variance Inflation Factor/VIF) and path coefficient.

Table 4. R Square Test Results

Variable	R Square
<i>Patient Satisfaction</i>	0.738
<i>Continuance Intention</i>	0.738

Source: SmartPLS 4.0 Data Processing Results

Table 4 shows that patient satisfaction has an R square value of 0.738, this appears that performance expectancy, perceived need, perceived value, perceived ease of use have the ability to explain the patient satisfaction variable of 73.8%. Moreover, the continuation intention variable has an R square esteem of 0.738, this shows that performance expectancy, patient satisfaction, perceived ease of use have the ability to explain the continuance intention variable by 73.8%. Apart from that, it can also be explained that the ability of the independent variables in this study to explain patient satisfaction and continuance intention variables is included in the moderate category.

Table 5. Collinearity test (VIF) results

Variable	<i>Patient Satisfaction</i>	<i>Continuance Intention</i>
<i>Patient Expectancy</i>	3,520	2,854
<i>Perceived Need</i>	3,261	
<i>Perceived Value</i>	4,094	
<i>Perceived Ease of Use</i>	2,687	2,587
<i>Patient Satisfaction</i>		2,781

Source: SmartPLS 4.0 Data Processing Results

In Table 5, it is shown that variance inflation factor (VIF) value in the research model test results where the VIF value for all variables was found to be <5 . This shows that the quality of this research model is acceptable in terms of not having multicollinearity issues.

Table 6.Hypothesis test

Hypothesis	Standardized Path Coefficient	P-Values	T-Statistics	Decision
H1: Performance expectancy has a positive effect on patient satisfaction	0.132	0.013	2,236	Supported
H2: Perceived need has a positive effect on patient satisfaction	0.265	0,000	5,050	Supported
H3: Perceived value has a positive effect on patient satisfaction	0.354	0,000	5,316	Supported
H4: Perceived ease of use has a positive effect on patient satisfaction	0.195	0,000	3,455	Supported
H5: Perceived ease of use has a positive effect on Continuance intention	0.185	0,000	3,613	Supported
H6: Patient satisfaction has a positive effect on Continuance intention	0.547	0,000	10,585	Supported
H7: Performance Expectancy has a positive effect on Continuance Intention	0.197	0,000	3,971	Supported

Based on the test results above, it shows that performance expectancy, perceived need, perceived value, perceived ease of use have a significant and positive influence on patient satisfaction. As well as the variables performance expectancy, perceived ease of use, patient satisfaction have a significant and positive influence on continuance intention, and further explanation of each hypothesis will be explained further in the discussion below.

Data from 312 respondents was collected and analyzed using the PLS-SEM method using the SmartPLS statistical application. The results of the analysis show that all research indicators and variables meet the validity and reliability requirements, and there are no multicollinearity problems in the research model. All hypotheses in the research were accepted.

Performance expectations has a significant, positive influence on patient satisfaction, (t-statistic value = 2.236), which is similar to a study by (Wendland et al., 2019) in the mobile Primary Health Care (PHC) system on MECS ((Andry et al., 2023);(Ramadhan et al., 2021)). Perceived need also has a significant influence on patient satisfaction (t-statistic value = 5.050), which is in accordance with a study by (Fatimah et al., 2020) that found a positive influence between fulfilling basic human needs and patient satisfaction. Similar finding was found in another study by (Kalumata et al., 2021) which shows a positive influence between HaloDoc application user satisfaction on fulfilling health information needs.

Perceived value has a significant influence on patient satisfaction (t-statistic value = 5.316). Consistent findings are also found in studies by ((Bea et al., 2020); (Rahmani, 2017);(Surydana, 2017)). We also found that perceived ease of use has a significant influence on patient satisfaction (t-statistic value = 3.455), which is in line with studies conducted by ((Amin et al., 2014); (Hidayat & Winarno, 2014)).

Perceived ease of use also has a significant influence on continuance intention (t-statistic value = 3.613). Similar findings were found in a study by (Alam et al., 2018), where perceived ease of use was proven to have a positive relationship with intention to use mHealth services. Another study by (Hoque et al., 2016) also found that perceived ease of use is a significant factor that influences a person's intention to adopt e-Health.

Patient satisfaction includes a noteworthy impact on continuance intention (t-statistic value = 10.585). This further affirms previous study results by (Wendland et al., 2019), (Alalwan, 2020), and (Kaium et al., 2020), who also consistently showed positive impact of patient satisfaction on continuance intention.

There are several limitations of this study that might be beneficial as points of improvements for the future research. Firstly, we had limited insight access in the application, so we did not acquire the real total amount of users. Secondly, our relationship with the management of Halodoc was also limited, which then also limited our whole understanding of the real challenges faced by the application. These might be improved significantly in the future by setting a collaborative measures with the studied application.

CONCLUSIONS

This research concludes that Performance Expectancy, Perceived Need, Perceived Value, and Perceived Ease of Use have a positive influence on Patient Satisfaction among Halodoc Telemedicine application users in Jabodetabek in 2023. In addition, Performance Expectancy, Perceived Ease of Use, and Patient Satisfaction are known to have positive influence on Continuance Intention. These results show that improving the aforementioned aspects can encourage users to continue using the Halodoc application.

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