The Influence of Perceived Ease of Use, Perceived Usefulness, and Price Value on Behavioral Intention of Telemedicine Application Users

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ABSTRACT

Keywords: Behavioral intention; perceived ease of use; perceived usefulness; price value; telemedicine

The increasing demand for healthcare services and the challenges posed by geographical barriers have made telemedicine an essential tool in providing accessible and efficient healthcare. In regions with limited access to healthcare facilities, telemedicine has proven to be a critical solution for delivering timely care and reducing the burden on traditional healthcare systems. This research aims to explore the factors influencing the behavioral intention of telemedicine application users, specifically focusing on perceived ease of use, perceived usefulness, and price value. This research employed a quantitative approach, research method with a cross-sectional approach, with data collected from 119 telemedicine users in Indonesia. Data were analyzed using Partial Least Square-Structural Equation Modeling (PLS-SEM)). The results indicate that the scores for each research variable perceived ease of use, perceived usefulness, and price value significantly and positively influence the intention to use telemedicine. The questionnaire was found to be valid and reliable, meaning that the questions in the survey are suitable for use as research instruments. These findings underscore the growing importance of telemedicine in improving healthcare accessibility and efficiency, especially in the context of post-pandemic healthcare systems.

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Introduction

WHO defines telemedicine as the delivery of health care services, where distance is a significant factor, by all health care professionals using information and communication technologies to transform valid information for the diagnosis, treatment, and prevention of disease and initiation, research and evaluation, and for the continuing education of health care providers, all for the sake of advancing the health of individuals and their communities (Neculau et al., 2022). Telehealth is a broader umbrella term that includes other remote health-related services, such as administration, continuing medical education, and/or provider training. Modern telemedicine has been used since the early 1900s (Mahar et al., 2018). Telemedicine

users are spread throughout the world, and the number of users increases every year. In 2017, the number of consultations was estimated at 26.82 million worldwide, and it continues to increase. It is estimated that the number of consultations will reach 127 million by 2027 (Anon, n.d.).

Telemedicine has several significant benefits, such as increasing access to healthcare services, especially for patients living in remote areas or with limited mobility, and reducing the cost and travel time required for medical consultations (Smith et al., 2020). In addition, telemedicine has become an essential element during the COVID-19 pandemic, helping to maintain the continuity of healthcare services without the need for face-to-face contact and contributing to the digital revolution in healthcare (Keesara et al., 2020). However, there are several challenges and negative impacts that need to be addressed, such as the potential for a lack of quality face-to-face interactions between patients and doctors, technological limitations in some regions, and issues with patient data privacy and security (Gajarawala & Pelkowski, 2021). Although telemedicine shows great potential in increasing access and efficiency, solutions are needed to overcome regulatory, infrastructure, and quality of care barriers. Many factors influence the use of telemedicine in the community.

Factors such as internet connectivity, reliability of transportation between residence and healthcare facility, presence of chronic medical conditions, and frequent visits to healthcare facilities are some of the factors associated with the increased use of telemedicine (Chandrasekaran, 2024). Previous studies have also linked socio-economic and demographic factors to telemedicine use, where female gender, married people, younger age, and higher education levels are associated with higher levels of telemedicine use. On the other hand, some reasons for not using telemedicine are not knowing about telemedicine and not knowing how to use it. In addition, there are also doubts about privacy and preferences for face-to-face consultations (Zailani et al., 2014).

This study aims to determine the behavioral intention of telemedicine application users, which is influenced by factors such as perceived ease of use, perceived usefulness, and price value. Until now, no study has comprehensively analyzed the behavioral intention of telemedicine application users toward perceived ease of use, perceived usefulness, and price value without being limited to certain types of diseases or applications.

Research Methods

This research uses a quantitative research method with a cross-sectional approach. Indonesian people who have and are still using telemedicine are the target population, with telemedicine users who can access the research questionnaire and are willing to participate in this study, as they are an affordable population. The sample taken for this study must meet the following criteria: 1) Have used telemedicine in the past year, 2) Domiciled in Indonesia when using telemedicine services, and 3) Agree to be a respondent in this study. Samples will be excluded if they do not complete the questionnaire. Respondents who agree to participate in this study will be given a hardcopy or softcopy questionnaire using a Google form and asked to fill it out completely without including their identity. The questionnaire in this study consists of 20 statements consisting of 5 statements, each related to behavioral intention, perceived ease of use, perceived usefulness, and price value compiled by the researcher (Appendix 1). All of these questions can be filled in using a Likert scale of 1 (strongly disagree) to 5 (strongly agree).

Respondent data collection for this study was conducted in October 2024. The collected data was then processed using the SmartPLS application using the multivariate Partial Least Square-Structural Equation Modeling (PLS-SEM) method (Sarstedt & Cheah, 2019).

Results and Discussion

A total of 119 samples were successfully obtained in this study, from the 119 samples, the majority gave a score of 4 or agreed based on the Likert scale for behavioral intention, perceived ease of use, perceived usefulness, and price value. The distribution of values given for each statement is shown in Table 1.

Table 1. Distribution of questionnaire content

Questionnaire	Number	Mean	Median	Min	Max	SD	EK	Skewness
Behavioral intention (BI)	1	4,39	4	1	5	0,75	6,15	-1,97
	2	4,43	4	1	5	0,76	6,40	-2,08
	3	4,38	4	1	5	0,76	5,69	-1,92
	4	4,28	4	1	5	0,79	5,94	-1,90
	5	4,29	4	1	5	0,78	6,36	-1,96
Perceived ease of use (PEoU)	1	4,36	4	1	5	0,78	4,86	-1,79
	2	4,27	4	1	5	0,87	4,33	-1,78
	3	4,38	4	1	5	0,79	4,95	-1,84
	4	4,35	4	1	5	0,81	5,58	-1,96
	5	4,26	4	1	5	0,81	4,83	-1,75
Perceived usefulness (PU)	1	4,25	4	1	5	0,82	4,87	-1,78
	2	4,22	4	1	5	0,81	3,07	-1,38
	3	4,27	4	1	5	0,87	4,33	-1,78
	4	4,24	4	1	5	0,80	3,67	-1,53
	5	4,31	4	1	5	0,79	4,12	-1,63
Price value (PV)	1	4,20	4	1	5	0,75	3,20	-1,31
	2	4,21	4	1	5	0,77	4,01	-1,47
	3	4,21	4	1	5	0,78	3,97	-1,48
	4	4,30	4	1	5	0,75	5,60	-1,77
	5	4,31	4	1	5	0,79	5,92	-1,94

Source: Primary data (2024); *SD: Standard Deviation; EK: Excessive Kurtosis

Figure 1 shows the researcher's hypothesis model and the loading values of each statement on each variable. All statements on behavioral intention, perceived ease of use, perceived usefulness, and price value are considered important with loading values ≥ 0.7 so that the 20 statements can be maintained.

The questionnaire used for data collection was tested before being applied in this study. A trial was conducted to assess the validity and reliability of the instrument. The testing process involved selecting a target sample of [insert sample size], and the questionnaire was distributed to respondents who were similar to the target population of the main study. The results of the trial showed that the questionnaire was both valid and reliable, confirming that the questions effectively measured the intended research variables. The validity of the instrument was ensured through expert review and pilot testing, while the reliability was assessed using Cronbach's Alpha, which exceeded the acceptable threshold. This ensured that the 20 statements in the questionnaire could be used with confidence in the study.
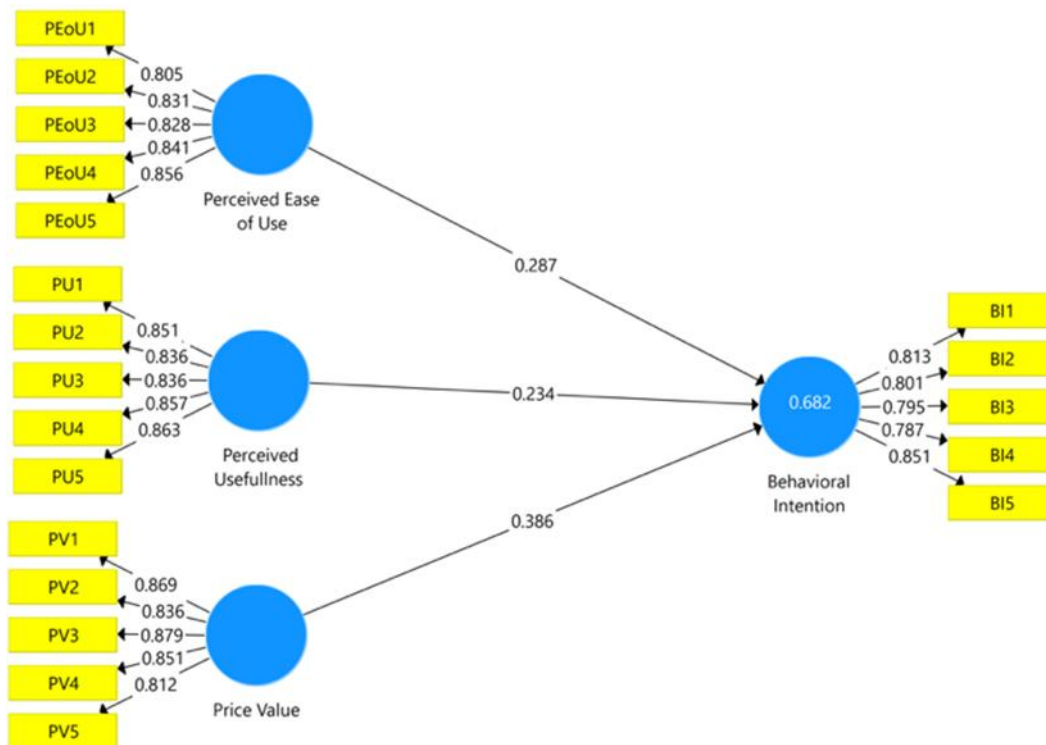
Figure 1. Hypothesis model along with loading values for each question related to behavioral intention, perceived ease of use, perceived usefulness, and price value

Construct reliability and validity of behavioral intention, perceived ease of use, perceived usefulness, and price value were achieved with Cronbach's Alpha, rho_A, and Composite Reliability values ≥ 0.7 and Average Variance Extracted (AVE) values ≥ 0.5 (Table 2).

Table 2. Validity and reliability.

	Cronbach's Alpha	rho_A	Composite Reliability	AVE
BI	0,90	0,91	0,93	0,72
PEoU	0,87	0,87	0,91	0,66
PU	0,89	0,89	0,92	0,69
PV	0,90	0,90	0,93	0,72

Source: P primary data (2024); *AVE: Average Variance Extracted; BI : Behavioural Intention; PEoU : Perceived Ease of Use; PU : Perceived Usefulness; PV : Price value

Based on the Fornell-Larcker criterion and the Heterotrait-monotrait Ratio (HTMT), behavioral intention, perceived ease of use, perceived usefulness, and price value each had an HTMT ratio > 0.9, and all had a square root value of AVE greater than the correlation between the variable and other variables (Table 3). Therefore, the discriminant validity of these four variables can be accepted.

Table 3. Discriminant validity

8	PU	BI	PEoU	PV
PU	0,85			
BI	0,72 [0,81]	0,81		
PEoU	0,74 [0,82]	0,75 [0,85]	0,83	
PV	0,72 [0,79]	0,77 [0,86]	0,75 [0,84]	0,85

Source: Primary data (2024); *BI : Behavioural Intention; PEoU : Perceived Ease of Use; PU : Perceived Usefulness; PV : Price value; Fornell-Larcker Criterion [Heterotrait-monotrait Ratio]

For the outer model, it was found that all statements in each variable had a p value <0.05, which indicated statistical significance with a positive T statistics β value so that each variable was influenced by the value of each indicator or statement (Table 4).

Table 4. Outer model

	O	M	STDEV	|O/STDEV|	P Values
BI1 <- Behavioral Intention	0,81	0,81	0,04	18,81	0,000
BI2 <- Behavioral Intention	0,80	0,78	0,09	9,12	0,000
BI3 <- Behavioral Intention	0,79	0,78	0,08	10,15	0,000
BI4 <- Behavioral Intention	0,79	0,76	0,08	9,01	0,000
BI5 <- Behavioral Intention	0,85	0,84	0,05	17,42	0,000
PEoU1 <- Perceived Ease of Use	0,81	0,77	0,13	6,13	0,000
PEoU2 <- Perceived Ease of Use	0,83	0,81	0,09	8,65	0,000
PEoU3 <- Perceived Ease of Use	0,83	0,80	0,12	6,68	0,000
PEoU4 <- Perceived Ease of Use	0,84	0,82	0,09	9,28	0,000
PEoU5 <- Perceived Ease of Use	0,86	0,83	0,13	6,51	0,000
PU1 <- Perceived Usefulness	0,85	0,83	0,09	9,41	0,000
PU2 <- Perceived Usefulness	0,84	0,82	0,06	14,07	0,000
PU3 <- Perceived Usefulness	0,84	0,81	0,10	8,04	0,000
PU4 <- Perceived Usefulness	0,86	0,84	0,06	13,96	0,000
PU5 <- Perceived Usefulness	0,86	0,85	0,05	18,20	0,000
PV1 <- Price Value	0,87	0,86	0,04	20,41	0,000
PV2 <- Price Value	0,84	0,83	0,05	17,13	0,000
PV3 <- Price Value	0,88	0,87	0,04	21,14	0,000
PV4 <- Price Value	0,85	0,84	0,04	19,19	0,000
PV5 <- Price Value	0,81	0,79	0,06	13,67	0,000

Source: Primary data (2024); *O: Original Sample; M : Sample Mean; SDTEV : Standard Deviation; |O/STDEV| : T Statistics

In the inner model, the path hypothesized by the researcher is proven with a p-value <0.05, which indicates a meaningful result with a positive T statistic or β value so that there is a positive correlation between each perceived usefulness, perceived ease of use, and price value towards behavioral intention (Table 5).

Table 5. Inner model

	O	M	STDEV	|O/STDEV|	P Values
Perceived Usefulness -> Behavioral Intention	0,23	0,22	0,11	2,15	0,032
Perceived Ease of Use -> Behavioral Intention	0,29	0,28	0,13	2,29	0,023
Price Value -> Behavioral Intention	0,39	0,39	0,11	3,39	0,001

Source: Primary data (2024); *O : Original Sample; M : Sample Mean; SDTEV : Standard Deviation; |O/STDEV| : T Statistics

In this study, all statements on each perceived usefulness, perceived ease of use, and price value towards behavioral intention were valid and reliable. They had a strong positive correlation with behavioral intention. Rho et al. (2014) had findings that were in line with this study. In a study conducted on 183 doctors, perceived usefulness was found to directly influence a person's behavioral intention, especially in health service situations. The benefits of perceived

usefulness in a telemedicine service already have real evidence in South Korea, resulting in good behavioral intention in health services that have been felt by doctors involved in the Rho et al. (2014) study. In Taiwan, Kung et al. (2024) also found something similar where perceived usefulness correlated positively with behavioral intention. Kung et al. (2024) also stated that perceived usefulness can influence behavioral intention due to a sense of trust in the telemedicine platform chosen by a person. In addition, changes in the era also do not change the influence of perceived usefulness on a person's behavioral intention because there is a new generation of society that also needs health services. Dewanta et al. (2023) explained that in the era of the COVID-19 pandemic, the use of telemedicine increased due to drastically increased needs, so the perceived usefulness of telemedicine increased. Ultimately, this caused the behavioral intention towards the use of telemedicine to persist until now. Adiwinata and Yusran (2023) also added that perceived usefulness has a positive correlation with behavioral intention because of the value given to service through telemedicine. The findings of perceived usefulness in this study strengthen previous findings regarding its positive correlation with behavioral intention.

Perceived ease of use is known to be one of the key factors in the use of telemedicine according to Lin et al. (2024). The existence of telemedicine itself is able to shorten a person's access to health facilities so that geographical limitations can be eliminated and reduce the potential for an increase in emergency incidents. Therefore, perceived ease of use has become an inherent part of telemedicine itself. Perceived ease of use means there are no limitations for a person to get health services so that a person's behavioral intention can increase. Telemedicine, which is inseparable from technology, is also the reason why perceived ease of use can influence a person's behavioral intention. According to Budi et al. (2013), people in this era who already have a fairly high understanding of internet use have a lower need for stimulation in perceived ease of use of telemedicine, people in this era who already have a fairly high understanding of internet use have a lower need for stimulation in perceived ease of use of telemedicine to be lower. Therefore, with a little perceived ease of use stimulation in this era, it is enough to have a strong influence on behavioral intention in terms of using telemedicine. Hossain et al. (2023) also added that perceived ease of use is positively correlated with behavioral intention because there are benefits from the economic side of health service users. Telemedicine can reduce unexpected costs outside the cost of health services themselves so that telemedicine with the best perceived ease of use can increase the number of users of these telemedicine services.

Price value is also known to have a strong positive correlation with behavioral intention. In fact, according to Pramudita et al. (2023) and Utami et al. (2024), price value is one of the strongest predictors that influence a person's behavioral intention toward using telemedicine. According to Pramudita et al. (2023), this can happen because price value is closely related to a person's financial ability, so behavioral intention toward using telemedicine is also affected. This has the most impact on someone in the lower middle economic class or the younger working generation who still has limited income. The same thing was also found by Utami et al. (2024) during the COVID-19 pandemic in Indonesia. During that time, the influence of price value was even stronger in influencing a person's behavioral intention. Price value can determine a person's behavioral intention to use the same telemedicine service again. Vidal-Silva et al. (2024) and Mizana et al. (2023) also added that both of them agreed that the

influence of price value would become stronger on behavioral intention, especially when the price value obtained from telemedicine exceeds what is paid.

There are limitations in this study, such as the limited number of respondents and the mapping of the types of telemedicine used. The number of respondents involved in this study is sufficient based on sample needs but not heterogeneous enough so that it cannot describe the characteristics of all telemedicine users. In addition, this study did not standardize the telemedicine used so that the experience felt by each respondent regarding the use of one telemedicine can be different for the same statement. Although it has limitations, the results of this study can be accounted for with meaningful statistical test results and a careful data analysis process.

Conclusion

The questionnaire used in this study is valid and reliable in measuring the influence of perceived usefulness, perceived ease of use and price value on behavioral intention. Perceived usefulness, perceived ease of use and price value have a strong positive correlation with a person's behavioral intention in using telemedicine. Respondents need to be categorized based on the type of telemedicine used in similar studies that will be conducted in the future so that the comparison of behavioral intention towards the use of telemedicine is more accurate.

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