ANALYSIS OF FACTORS RELATED TO INTENTION-TO-USE TELEMEDICINE SERVICES (TELECONSULTATION) IN JABODETABEK RESIDENTS DURING THE COVID-19 PANDEMIC IN 2021

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Abstract. The emergence of COVID-19 pandemic has made it difficult for people to access health services. According to JKN statistics, FKTP visits was decreased from 337.69 million (2019) to 193.03 (2021). Teleconsultation, a type of telemedicine, could be the right solution so that people can still access the health services they need and protect themselves from the spread of COVID-19. There was an increase in the use of several teleconsultation applications in Indonesia during pandemic, from 4 million to more than 15 million people. However, this rate is only 7.63% of the internet users and 5.6% of the total population of Indonesia, so increasing access to health services through telemedicine is still challenging to achieve. Therefore, this study aims to determine the description and factors related to the intention to use health teleconsultation services during COVID-19 pandemic among Jabodetabek residents aged 19-49. This quantitative study used a cross-sectional design and PLS-SEM data analysis method. The results showed a significant relationship between social influence, perceived usefulness, trust in providers, and trust in the internet on the intention to use teleconsultation services. Intention-to-use was also significantly related to the use of teleconsultation services. In addition, a significant relationship was found between perceived need with trust in the provider, and perceived health risk and perceived ease of use with perceived usefulness.

Keywords: Intention-to-use, Telemedicine Adoption, Technology Acceptance Model, Health Belief Model, Andersen's Behavioral Model of Health Service Utilization

Abstrak. *Pandemi COVID-19 menyebabkan masyarakat kesulitan dalam mengakses pelayanan kesehatan. Berdasarkan statistik JKN, kunjungan FKTP menurun dari 337,69 juta (2019) menjadi hanya 193,03 juta (2021). Telekonsultasi, salah satu jenis telemedicine, dikatakan dapat menjadi solusi yang tepat agar masyarakat tetap dapat mengakses pelayanan kesehatan yang dibutuhkan sekaligus menjaga diri dari penularan COVID-19. Terdapat peningkatan penggunaan aplikasi telekonsultasi di Indonesia semasa pandemi, dari 4 juta menjadi lebih dari 15 juta orang. Tetapi, angka ini hanya 7,63% dari penduduk pengguna internet dan 5,6% dari total populasi Indonesia sehingga peningkatan akses pelayanan kesehatan melalui telemedicine masih terbilang sulit untuk dicapai. Oleh karena itu, penelitian ini bertujuan untuk mengetahui gambaran serta faktor yang berhubungan dengan intention-to-use layanan telekonsultasi di masa pandemi COVID-19 pada penduduk Jabodetabek usia 19-49 tahun. Penelitian kuantitatif ini menggunakan desain cross-sectional dengan metode analisis data PLS-SEM. Hasil penelitian menunjukkan adanya hubungan signifikan antara pengaruh sosial, perceived usefulness, trust in provider, dan trust in internet terhadap intention-to-use layanan telekonsultasi. Intention-to-use juga terbukti berhubungan signifikan dengan penggunaan sesungguhnya dari layanan telekonsultasi. Selain itu, ditemukan pula hubungan signifikan antara perceived need dengan trust in provider, serta perceived health risk dan perceived ease of use terhadap perceived usefulness.*

Kata Kunci: *Niat Penggunaan, Adopsi Telemedicine, Technology Acceptance Model, Health Belief Model, Andersen's Behavioral Model of Health Service Utilization.*

INTRODUCTION

Since the beginning of 2020, the world has been shocked by the emergence of a new disease, COVID-19, which later developed into an epidemic. COVID-19 cases in Indonesia are high because on October 22, 2021, Indonesia was ranked 14th as the country with the most cases worldwide (1). To reduce transmission, the government issued a policy restricting people's movement. With this restriction, mainly when health facilities focused on fulfilling the needs of COVID-19 patients, the stigma and fear in society made it more challenging to provide health services for other diseases. When there is

overcapacity in health facilities, and the community cannot get the health services they need, the number of direct deaths from COVID-19 and indirect deaths from diseases that could otherwise be prevented and treated will increase drastically (2). According to JKN data, the COVID-19 pandemic has impacted decreasing visits to health facilities. In 2019, FKTP had 337.69 million visits, and FKRTL had 84.75 million visits, then decreased to 193.03 and 44.27 million visits in August 2021 (3).

To answer this problem, Telemedicine can be a solution to maintain and even increase public access to health services and prevent the spread of COVID-19 (2). Of the countries experiencing health service disruptions due to the pandemic, around 58% of countries have used telemedicine to replace face-to-face doctor consultations (4). One of the telemedicine services that many people need is clinical teleconsultation. Clinical teleconsultation is a remote clinical consultation service to help establish a diagnosis and/or provide considerations/advice (*Permenkes No. 20 Tahun 2019*, n.d.). The existence of teleconsultation makes people no longer need to come to the doctor or hospital directly to check their health condition and ask for treatment recommendations.

In Indonesia, there is an increase in the use of doctor consultation applications that have collaborated with the Indonesian Ministry of Health from 4 million to more than 15 million people (6). Although there is an increase, this number is relatively small compared to the number of Indonesians who have used the internet, which is 196.7 million people (7.63%) (7). If compared to Indonesia's population of 269.6 million people, the percentage of telemedicine application users is only 5.6% (8). With these numbers, the hope of expanding and facilitating public access to health services through telemedicine or internet-based services is still challenging. Even so, there are very few studies in Indonesia that analyze what causes people to still not want to use telemedicine, especially teleconsultation, and what things relate to people's intentions to use teleconsultation, either application-based or institutional.

The author targeted the Jabodetabek area in this study for the following considerations: (1) The number of COVID-19 cases, of which Jabodetabek contributed 27.01% of the total confirmed COVID-19 cases as of 23/10/2021 (9); (2) The level of mobility, where many of the residents have activities that require them to commuting (10); (3) The level of health complaints, where about 1 in 4 Jabodetabek residents have experienced health complaints in the last month (11); the level of internet usage, where DKI Jakarta (85% of the total population), Banten (78.5%), and West Java

(71.6%) occupy the first, second, and fourth positions in Java (7). This study aims to determine the description and factors related to the intention to use health teleconsultation services during the COVID-19 pandemic in Jabodetabek residents, both application-based and institutional teleconsultation.

This study uses a model compiled based on a synthesis of Andersen's Behavioral Model of Health Service Utilization (12) as well as the Technology Acceptance Model (TAM) and Health Belief Model (HBM) Extension, which have been synthesized by Nurbojatmiko & Wahyuni (2017) and Zhao et al. (2018) to obtain 12 variables from aspects of health service utilization, technology acceptance, and behavior/belief in health.

H1: Gender is significantly related with intention-to-use teleconsultation.

Research by Lee & Rho (2013) and Drake et al. (2021) found that female individuals had more positive perceptions or were more likely to use telemedicine than men. This variation in use may be due to fundamental differences in social drivers, patient and provider preferences, technological literacy, and the complexity of the patient's condition and type of medical visit, whether evaluation, diagnostic, consultation, or intervention (16).

H2: Education level is significantly related to intention-to-use teleconsultation.

Research by Luo et al. (2021) found that education level has a significant effect on telemedicine adoption. Fischer et al. (2020) said that people with a minimum education level in secondary school had lower telehealth use levels than those with higher education.

H3: Occupation is significantly associated with intention-to-use teleconsultation.

Employment status is said to be significantly related to at least one type of health-promoting behavior among users of the mHealth application (19). Employment is often linked to income and the ability to pay. Drake et al. (2021) find that higher incomes are more likely to use telemedicine. Telemedicine is known to reduce the burden of costs that must be incurred (20).

H4: Social influence is significantly related to intention-to-use teleconsultation.

This study's results (15) found a significant difference between mHealth service users and non-users related to social influence. The social impact

often influences adopting technology such as mHealth (21,22).

H5: Evaluation of the nearest offline health facility is significantly related to the intention-to-use teleconsultation.

Salesika et al. (2021) found that travel time to health facilities and staff behavior were related to telemedicine services. Distance or access to health facilities often affects their utilization. The more difficult access is, the more reluctant people are to use these health services (24,25).

H6: Health consciousness is significantly related to the intention-to-use teleconsultation.

HC is health awareness or the degree to which health problems are integrated into a person's daily activities (26). Previous studies have shown that health awareness positively affects the intention to use e-Health services (13,27).

H7: Perceived need is significantly related to the intention-to-use teleconsultation.

Siboro et al. (2021) and Mallampati et al. (2021) found a relationship between perceived need or individual health assessment and the future use of telemedicine.

H8: Perceived health risk is significantly related to the intention-to-use teleconsultation.

PHR is an individual's belief in the severity and likelihood of exposure to a disease. Nurbojatmiko & Wahyuni (2017) found that PHR significantly influences the intention-to-use of e-Health services.

H9: Perceived usefulness is significantly related to the intention-to-use teleconsultation.

PU is defined as the belief that using the system will improve job performance (29). Alam et al. (2018) proves that Performance Expectancy (another name for PU) significantly affects intentions to use mHealth services.

H10: Perceived ease of use is significantly related to the intention-to-use teleconsultation.

PEOU means the belief that using the system will make work more accessible (29). PEOU is proven to have a significant relationship with the adoption of mHealth services (21,30).

H11: Trust in providers is significantly related with intention-to-use teleconsultation.

TP means individual trust in service providers (platforms/responsible doctors) for integrity and benefits (31,32). Previous research found that trust in providers positively related with behavioral intentions (33–35).

H12: Trust in the internet is significantly associated with intention-to-use teleconsultation.

TI means the extent to which a person believes that using the mHealth service is safe and does not threaten their privacy (36). Trust significantly impacts the intention to adopt mHealth (14,37).

METHODS

This research is a quantitative analytical descriptive study using a cross-sectional approach. Data was collected through an online survey using a questionnaire instrument with a 5-level Likert scale distributed in January 2022 to Jabodetabek residents aged 19 to 49 years, both users and non-users of teleconsultation services for the past year (January 2021 to January 2022) in total with 222 respondents. The data was analyzed using the Partial Least Squares Structural Equation Model (PLS-SEM) method using the SmartPLS 3 application and Google Spreadsheet.

RESULTS AND DISCUSSION

The description of the characteristics of the respondents in this study is most of them are women (71.2%), aged 19-25 years (66.7%), have a higher education degree (73%), and do not work (61.26%). Then, the description of the use of health teleconsultation services for Jabodetabek residents during the COVID-19 pandemic is as follows:

1. 36% of Jabodetabek residents have not used teleconsultation services during the past year (January 2021 - January 2022), 64% of Jabodetabek residents have used them with frequencies including: 52.8% used 1-2 times, 25.4% used as much as 2-4 times, and 21.8% used more than four times.

2. The most used teleconsulting service is technology platforms such as HaloDoc, AloDokter, Getwell, etc. (90% of the total who have used teleconsultation in the past year), and the problem that most users feel is the incorrect diagnosis result (35%).

3. Most non-users do not use teleconsultation because they do not need the service (75%).

4. Then, regarding information dissemination,

most information regarding teleconsultation comes from social media (81%).

5. The most popular consulting services are face-to-face consultations (46.6%) and via chat/written (41%). In addition, the most significant benefit of using teleconsultation services is that it can prevent someone from being exposed to diseases such as COVID-19 and facilitate access to health services.

Table 1. Respondents' Demographic Distribution

Category	Teleconsultation Use				Total	
	Use		Not Use			
	n	%	n	%	n	%
Sex						
Man	41	64,06	23	35,94	64	100,00
Woman	101	63,92	57	36,08	158	100,00
Total	**142**	**63,96**	**80**	**36,04**	**222**	**100,00**
Category	Teleconsultation Use				Total	
	Use		Note Use			
	n	%	n	%	n	%
Age						
19-25 years old	87	58,78	61	41,22	148	100,00
26-30 years old	27	75,00	9	25,00	36	100,00
31-35 years old	9	75,00	3	25,00	12	100,00
36-40 years old	8	72,73	3	27,27	11	100,00
41-45 years old	5	71,43	2	28,57	7	100,00
45-49 years old	6	75,00	2	25,00	8	100,00
Total	**142**	**63,96**	**80**	**36,04**	**222**	**100,00**
Domicile						
Jakarta	52	65,82	27	34,18	79	100,00
Bogor	18	58,06	13	41,94	31	100,00
Depok	26	66,67	13	33,33	39	100,00
Tangerang	20	64,52	11	35,48	31	100,00
Bekasi	26	61,90	16	38,10	42	100,00
Total	**142**	**63,96**	**80**	**36,04**	**222**	**100,00**
Education						
Low Education	13	59,09	9	40,91	22	100,00
High Education	129	64,50	71	35,50	200	100,00
Total	**142**	**63,96**	**80**	**36,04**	**222**	**100,00**
Employment						
Unemployed	81	59,56%	55	40,44%	136	100,00
Employed	61	70,93%	25	29,07%	86	100,00
Total	**142**	**63,96%**	**80**	**36,04%**	**222**	**100,00**

1. Measurement Model

The measurement model stage to measure the reliability and validity of indicators, where reliability is evaluated using Composite Reliability, whose value must be higher than 0.70, then validity is evaluated using Indicator Loading values which must be higher than 0.70 and Average Variance Extracted (AVE) which must be higher than 0.50 (38). Indicators with Loading < 0.70 need to be removed so that indicators SI3, SI4, FL3, FL4, FL5, HC1, PN1, and PHR2 are excluded from the measurement. The final results of the measurement model test are described in Table 2.

Tabel 2. Validity and Reliability Test Result (Measurement Model)

Variable	Indicator	*Outer Loading*	AVE	*Composite Reliability*	Result
Intention-to-Use	ITU1	0,797	0,704	0,934	Valid
	ITU2	0,863			Valid
	ITU3	0,865			Valid
	ITU4	0,777			Valid
	ITU5	0,879			Valid
	ITU6	0,848			Valid
Social Influence	SI1	0,905	0,798	0,819	Valid
	SI2	0,881			Valid
Evaluation of Offline Health Facilities	FL1	0,926	0,780	0,793	Valid
	FL2	0,839			Valid
Health Consciousness	HC2	0,868	0,712	0,857	Valid
	HC3	0,823			Valid
	HC4	0,840			Valid
Perceived Need	PN2	0,823	0,626	0,741	Valid
	PN3	0,758			Valid
Perceived Health Risk	PHR1	0,723	0,591	0,780	Valid
	PHR3	0,798			Valid
	PHR4	0,785			Valid
Perceived Usefulness	PU1	0,783	0,726	0,914	Valid
	PU2	0,894			Valid
	PU3	0,882			Valid
	PU4	0,844			Valid
Perceived Ease of Use	PEOU1	0,792	0,655	0,883	Valid
	PEOU2	0,805			Valid
	PEOU3	0,851			Valid
	PEOU4	0,787			Valid
Trust in Provider	TP1	0,859	0,717	0,910	Valid
	TP2	0,891			Valid
	TP3	0,851			Valid
	TP4	0,782			Valid
Trust in Internet	TI1	0,837	0,701	0,904	Valid
	TI2	0,859			Valid
	TI3	0,859			Valid
	TI4	0,793			Valid

After the convergent validity test (loading and AVE) is completed, the validity test is continued to discriminant validity by evaluating the Fornell and Larcker criteria. Based on the test results in Table 3, it can be seen that all variables have a correlation value with themselves (the square root of AVE) which is higher than the correlation value of that variable with other variables, or it can be said that the value in the top column is not smaller than the value indicated. The test concludes that this instrument is declared valid to be used as a measurement scale.

Tabel 3. Discriminant Validity Test Results: Fornell and Larcker Criteria

	FL	HC	ITU	SI	PEOU	PHR	PN	PU	TI	TP
FL	0,883									
HC	0,468	0,844								
ITU	0,385	0,481	0,839							
SI	0,230	0,354	0,539	0,893						

PEOU	0,340	0,436	0,657	0,378	0,809				
PHR	0,247	0,341	0,442	0,428	0,370	0,769			
PN	0,343	0,251	0,345	0,333	0,251	0,344	0,791		
PU	0,288	0,394	0,699	0,467	0,760	0,413	0,227	0,852	
TI	0,389	0,418	0,625	0,341	0,538	0,303	0,235	0,508	0,837	
TP	0,295	0,367	0,698	0,414	0,731	0,299	0,199	0,697	0,582	0,847

2. Structural Model

The structural model stage aims to evaluate the relationship hypothesized in the study. The evaluation is measured using the following criteria: (1) Coefficient of Determination (R^2), to measure how accurate the predictions of the model are; (2) Cross-Validated Redundancy (Q^2), to see the relevance of the predictions that have been prepared; and (3) Path Coefficients, to determine the value of the hypothetical relationship (38). The R^2 value of this study is 0.684, which falls into the moderate → strong category so it can be concluded that the variables in this study can explain the intention-to-use teleconsultation services by 68.5%. There are other variables can explain this but are not observed in this study. The Q^2 value of this study is 0.466 or 0, which means that the relevance and predictive accuracy of the research model is acceptable. Furthermore, the results of the Path Coefficients test are described in Table 4.

Tabel 4. Hypothesis Test Results

	Original Sample (O)	*Sample Mean (M)*	*Standard Deviation (STDEV)*	*T-Statistics*	*P-Values*	**Result**
Sex → ITU	0,039	0,043	0,042	0,948	0,344	Not Significant
Education → ITU	-0,041	-0,038	0,041	1,017	0,310	Not Significant
Employment → ITU	-0,007	-0,006	0,043	0,160	0,873	Not Significant
SI → ITU	0,158	0,167	0,058	2,724	0,007	Significant
FL → ITU	0,032	0,027	0,053	0,593	0,553	Not Significant
HC → ITU	0,089	0,085	0,062	1,434	0,152	Not Significant
PN → ITU	0,071	0,073	0,056	1,274	0,203	Not Significant
PHR → ITU	0,064	0,057	0,069	0,929	0,353	Not Significant
PU → ITU	0,242	0,239	0,073	3,330	0,001	Significant
PEOU → ITU	0,034	0,036	0,074	0,459	0,646	Not Significant
TP → ITU	0,251	0,252	0,067	3,774	0,000	Significant
TI → ITU	0,196	0,199	0,059	3,324	0,001	Significant
ITU → Actual Usage	0,281	0,291	0,058	4,862	0,000	Significant

Based on the table above, it is found that the variables of social influence (SI), perceived usefulness (PU), trust in provider (TP), and trust in the internet (TI) have a P-value below 0.05 and a T-statistic above 1.96 so it can be concluded that the four variables have a significant relationship with the intention-to-use of health teleconsultation services. In addition, intention-to-use also has a significant relationship with the actual use of teleconsultation services.

Social influence or the extent to which a person feels that family, friends, colleagues, or health workers, support or encourage his belief in using teleconsultation has been shown to be related to his intention to use teleconsultation services during the COVID-19 pandemic. This finding is in line with the research by Lee & Rho (2013), De Veer et al. (2015), Hoque & Sorwar (2017), Zhao et al. (2018), and Alam et al. (2018) which states that there is a significant relationship between the role of the surrounding environment and the use of telemedicine services. An individual is more likely to meet the expectations of others when the referring other person has the ability to reward the desired behavior or punish non-behavior (40,41) in Venkatesh et al. (2003). Verkijika & De Wet (2018) mentions in their research that social media is a medium that should be considered in terms of the social influence it causes. It is known that 81% of respondents in this study received information related to teleconsultation services from social

media, and as many as 76% said the information came from the internet, after that it was followed in third place by friends/family.

Perceived usefulness or a person's belief in the benefits that may be obtained from using teleconsultation has been proven to be related to his intention to use teleconsultation services during the COVID-19 pandemic. This finding is in line with the research by Venkatesh & Davis (2000), Chuttur (2009), Ahadzadeh et al. (2015), Y. Zhao et al. (2018), Nurbojatmiko & Wahyuni (2017), Hoque & Sorwar (2017), and Alam et al. (2018). Individuals who strongly believe that using e-health will help them (high perceived usefulness) are more likely to use these health-based internet applications in the future. On the other hand, individuals who do not believe that there are possible benefits to using e-health are less likely to use e-health (39). Based on the data obtained, some respondents still feel that teleconsultation is less beneficial for them. This is caused by several things, for example, the difficulty of exchanging information online, inappropriate or less convincing diagnoses obtained the existence of unnecessary drug prescriptions, and internet connection problems. However, not a few people agree that teleconsultation provides many benefits, including helping them to avoid exposure to disease, making it easier to get access to health services even during non-operational hours, saving costs, being time efficient, and so on.

Trust in a provider or someone's trust in a teleconsulting provider can increase their effectiveness in managing health, are accurate, timely, understandable, and useful proven to be related to their intention to use teleconsultation services during the COVID-19 pandemic. This is in accordance with the research by Yi et al. (2013), Mou et al. (2016), Gong et al. (2019), Octavius & Antonio (2021), and Wu et al. (2021). A person with a higher level of trust will feel less uncertain and more convinced that the services provided can increase the effectiveness in managing their health (34). When patients are provided with information that is accurate, timely, understandable, and useful, they are more likely to believe that doctors can provide high-quality care (46).

Trust in the internet or someone's trust in the use of teleconsultation that is safe and does not pose a threat to their privacy has been shown to be related to their intention to use teleconsultation services during the COVID-19 pandemic. This finding is in line with the research by Guo et al. (2015), Y. Zhao et al. (2018), Deng et al. (2018), and An et al. (2021). When people perceive the potential risks that may occur due to the use of mHealth they are less likely to trust and adopt the service (30). In the context of mHealth, security and privacy risk refer to the

possible misuse of information such as theft and leakage of information (48). Potential users of the mHealth service may not want to use the app if they feel their privacy and security are being threatened (45).

In addition, several variables were found not to be directly related to intention-to-use, but were related to intermediate variables. This study found that an individual's perception of his own health condition (perceived need) was not directly correlated with his intention to use telemedicine, but was significantly related to trust or trust in doctors and the information they received, where that trust would make patients more willing to use telemedicine. telemedicine services (35). Individuals with high health assessments tend to assume that their bodies do not have very serious problems and are more likely to believe that the medical services provided by doctors can meet their needs (49). Perceived health risk or a person's knowledge of the health risks they might get if they seek treatment at offline health services is proven not to be able to influence their decision to use teleconsultation services but is mediated by perceived usefulness. Further findings, this study which is also supported by research by Nurbojatmiko & Wahyuni (2017) finds that PEOU does not have a correlation with intention-to-use, but it has a significant relationship with perceived usefulness. This means that users with lower effort in operating the mHealth application may have higher expectations of benefiting from using mHealth (50).

CONCLUSION

This study found that the intention of Jabodetabek residents to use teleconsultation services during the COVID-19 pandemic was significantly related to social influence, perceived usefulness, trust in providers, and trust in the internet. Intention-to-use was also shown to be significantly related to the actual usage of teleconsulting services. In addition, several variables were found not directly related to intention-to-use, but related to intermediary variables, namely: the perceived need was related to trust in the provider, and perceived health risk and perceived ease of use were related to perceived usefulness. Gender, education level, occupation, evaluation of nearest offline health facilities, health consciousness, perceived need, perceived health risk, and perceived ease of use were not significantly related to intention-to-use.

RECOMMENDATIONS

This study will give a few recommendations to teleconsultation service providers and the

Indonesian government. Service providers need to facilitate doctors so that they can implement service excellence so that patients get maximum satisfaction to recommend teleconsultation to people around them, develop digital technology that can be used as a diagnostic tool, and improve security in the system used to protect patients from a cyber problem such as data leak. The government needs to develop a digitization system for health facilities so that people who seek treatment face-to-face remain free from disease and are time efficient, then ensure the security system for the teleconsultation system is safe from cybercrime, and enforce regulations regarding prohibitions and sanctions on the distribution of patient personal data.

ACKNOWLEDGEMENT

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