

RESEARCH ARTICLE

Effect of Psychosocial Factors in the Use of Telemedicine

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Abstract

Telemedicine is the impact of industrial revolution 4.0, which urges the development of health system technology to increase access to health services. This condition is contrary to the use of society, where consumers decide to stop using telemedicine services after several benefits. This study aims to identify the effect of psychosocial factors on consumer decisions in utilizing telemedicine services. This study was analytical observational research with a cross-sectional design. The population of this study was consumers aged 17–40 years who needed access to health services. Data collection was done in January–May 2021 by distributing online questionnaires tested for validity and reliability to 198 respondents in Surabaya. The data obtained were analyzed using logistic regression. The results showed that consumer psychological factors, including motivation, psychology, and learning, influenced decisions to use telemedicine services ($p < 0.05$). Meanwhile, the social factors of the reference group did not have a significant effect ($p > 0.05$). High motivation, positive perception, learning, and family encouragement influence consumer decisions to use telemedicine services, whereas the reference group does not. This research can be used as a consideration for healthcare technology developers and decision-makers in promoting the use of telemedicine so that it continues to be used in the long term.

Keywords: Consumer decisions, health services, health technology development, psychosocial factors, telemedicine

Introduction

Various countries in the world have now taken advantage of information and communication technology to improve the convenience of the community in accessing public services, including public health services.¹ Currently, with the industrial revolution 4.0, technological developments continue to rush and encourage technological evolution that urges various public sectors. Undeniably, the health sector has also faced the impact of this 4.0 industrial revolution through various health technology developments. One example of technology development in the health sector is telemedicine services.²

Telemedicine is a medical service practice for diagnosis, consultation, education, and transfer of medical data using information technology as a mode of communication.³ The World Health Organization (WHO) also defines telemedicine as providing health services with distance as the main factor through information and communication technology.^{4,5} This telemedicine service has many benefits for health workers and patients because it can save time and resources

and increase the effectiveness of providing health services to patients.³ This is because, through information and communication technology, interactions between health workers and patients will be carried out online through various platforms so that it can obtain many benefits.⁶

Since the COVID-19 pandemic in 2020, there has been a significant increase in the use of telemedicine due to various policies related to restrictions on community mobility.⁷ Many people have started using telemedicine services to consult with doctors, get diagnoses, and purchase drugs online to take care of themselves and others. However, new problems began to arise regarding the allotment of telemedicine services due to increasing consumer demand since the COVID-19 pandemic. Based on research conducted in the United States on 934 users of telemedicine services, 427 respondents, or 45.7% of all, decided to stop using because of loss of interest and hidden costs.⁸ This is undoubtedly a severe problem faced by the public telemedicine service development platform, so it is essential to identify what factors influence consumer decisions in utilizing telemedicine services.

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The rapid increase in telemedicine services during the COVID-19 pandemic shows that external or environmental factors significantly influence. However, other things related to external factors are also essential to identify, namely social factors and individual factors related to consumer psychology.⁹ Basically, consumer behavior is influenced by personal, psychological, social, and cultural factors.¹⁰ Several studies investigate consumer behavior related to problems security with or ethical use of tracking apps,¹¹ the use of health applications on smartphones,¹² as consumer adoption and acceptance behavior in digital health services¹³ based on various technology acceptance theories.^{7,9}

In telemedicine, trust or psychological between consumers and providers is very important because of virtual situations where they cannot communicate directly.¹⁴ This indicates that consumer motivation, perception, social factors, or psychosocial consumers have an essential role in the consumer's decision-making to use telemedicine.⁹ However, there are still few studies that identify the influence of consumer psychosocial factors in the use of telemedicine. Hence, this study aims to determine the effect of psychosocial factors on consumer decisions in telemedicine.

Methods

This study was analytical observational research with a cross-sectional study. The population in this study were all people aged 17–65 who actively use smartphones (smartphones). The inclusion criteria applied in this study were having internet access, knowing the existence of telemedicine services, requiring access to healthcare services during the research period, agreeing on informed consent, and being willing to become research subjects. This inclusion criterion aims to obtain a population relevant to the research objectives and reduces bias in the data collection process. Based on the calculation of the sample size according to Lemeshow, the minimum number of respondents in this study was 100 participants. This research was conducted regarding ethical clearance number 175/HRECC.FODM/IV/2021 from Airlangga University Faculty of Dental Medicine Health Research Ethical Clearance Commission.

Data collection was carried out from January to May 2021 through the distribution

of questionnaires along with informed consent to the population in Surabaya. Surabaya is the capital city of East Java province, with an area of 326.36 km². The administrative area of the city of Surabaya consists of Central Surabaya, North Surabaya, East Surabaya, South Surabaya, and West Surabaya, which consists of 31 sub-districts and 153 urban villages. The largest age group in the city of Surabaya is in the range of 20–24 years.¹⁵ The questionnaires were distributed to the population provided online through social media. Each question has been tested for validity and reliability outside the population group with an $r=0.785$. The score on each question consists of values from 1 to 4. The higher the score, the higher the value on that variable. After screening data, there 215 subjects were collected at the beginning, but 17 participants were excluded because they claimed they didn't require healthcare services during the research period, so a total of 198 respondents who met the inclusion criteria during the research period in this study were analyzed.

The data analysis process was carried out descriptively and analytically. Descriptive statistical analysis was conducted to describe the characteristics of the research respondents. The statistical test used is the logistic regression test to see the effect of psychosocial factors on the decision to use telemedicine services.

Results

The age group of respondents who are the research subjects is dominated by the age range of 17–25 years (83.8%). The most recent education level of respondents is high school graduates (71.2%). The respondent's occupation is dominated by a student (75.3%) with the highest income level in the range of fewer than one million rupiahs per month (65.7%). The majority of respondents have used telemedicine services, as many as 160 respondents, or 80.8% of the total research subjects (Table 1).

The results of the analysis of the respondents' psychological factors showed that motivation ($p=0.007$), perception ($p=0.017$), and learning ($p=0.000$) influenced their decision to use telemedicine services (Table 2). The social factors indicated that the family had a significant influence on consumer decisions in using telemedicine ($p=0.003$), while the reference group had no significant ($p=0.193$).

Table 1 Characteristics of Respondents

Variables	n=198 (%)
Age (years)	
17–25	166 (83.8)
26–35	22 (11.1)
36–40	10 (5.1)
Education	
Junior high school	3 (1.5)
High school	141 (71.2)
Diploma	8 (4.0)
Undergraduate degree (D4)	40 (20.2)
Graduate degree (S1)	6 (3.0)
Occupation	
Student	149 (75.3)
Private employees	20 (10.1)
Government employees	10 (5.1)
Entrepreneur	8 (4.0)
Unemployed	11 (5.6)
Income (million)	
<1	130 (65.7)
1–2.5	31 (15.7)
2.5–5	21 (10.6)
5–10	7 (3.5)
>10	9 (4.5)
Telemedicine use	
Yes	160 (80.8)
No	38 (19.2)

Discussion

Characteristics of respondents were reviewed based on age group, education level, occupation, and income earned. The majority of the age group respondents in this study were in the age group of 17–25 years (83.8%), followed by the age group of 26–35 years (11.1%). This age group is an age group that belongs to the millennial generation. The millennial generation is a young population born in 1981–2000 or at the age of 40 years.¹⁶ The millennial age group tends to be highly interested in and accept technological developments. Other research also states that the millennial age group, with the support of knowledge or higher education, has a greater chance of receiving telemedicine services.¹⁷

The majority of respondents' education in this study was in the high category, namely high school graduates 71.2% and D4/S1 graduates 23.2%. Other research also shows that consumer groups dominate telemedicine users with higher education.¹⁸ Someone with higher education will

be more interested in taking advantage of the latest technological innovations than individuals with low levels of education. Respondents with a high level of education have more curiosity to try new things, especially in the technology field.¹⁹

Students dominate the type of work in this study, and private workers use individual consumption patterns in utilizing a service.¹⁰ The advantage of telemedicine is that it facilitates access to health services anytime and anywhere, meeting to meet face to face. Research shows that telemedicine services are used by consumers who find it challenging to take time off from work and have difficulty leaving the house due to physical or mental limitations.²⁰ However, this cannot be considered because there was a pandemic during the research period, so all work was done from home. In addition, this telemedicine service can also be utilized by consumers of various income levels. Previous research has shown that consumers use telemedicine with lower-middle income²¹ or high-income.²²

In this study, consumer psychological factors, which include motivation, perception, and learning, significantly influence the decision to use telemedicine services ($p=0.007$). The results showed that cause motivation to fulfill their health needs and feel safe from disease transmission influenced their decision to use telemedicine. This is in line with previous research, which states that motivation can influence consumers to use telemedicine services, including hedonism (hedonic motivation).²³ Other studies also explain that encouraging consumers to use telemedicine services increases convenience, comfort, pleasure, and satisfaction in obtaining health services.²⁴ This shows that various internal and external factors can positively or negatively motivate consumers to use telemedicine services.²⁵

Consumer perception in this study proved to have a significant influence on the decision to use telemedicine ($p=0.017$). Respondents' perceptions consist of respondents' views or assessments of ease of access, ease of use, quality of service, and affordability of service rates in digital health service applications. This is supported by previous research, which states that the intention to use telemedicine services is a function of perceived ease of use, trust, perceived risk, and resistance to technology.²⁶ Other studies also state that consumer perceptions of the tariff, quality, and value of telemedicine services have a positive effect on the decision to use.²⁷

Table 2 Psychosocial Factors on Decisions to Use Telemedicine

Factors	Total Scores Categorization n=198 (%)				p	Exp (B)
	1	2	3	4		
Psychological						
Motivation	0 (0)	10 (5.1)	69 (34.8)	119 (60.1)	0.007*	2.662
Physiological drive to get access to health	1 (0.5)	14 (7.1)	108 (54.5)	75 (37.9)		
The urge to avoid queues or crowds	2 (1.0)	17 (8.6)	84 (42.4)	95 (48.0)		
Encouraging a sense of security from disease transmission	0 (0)	15 (7.6)	88 (44.4)	95 (48.0)		
Perception						
Ease of access	0 (0)	18 (9.1)	100 (50.5)	80 (40.4)	0.017*	2.000
Ease of use	0 (0)	10 (5.1)	88 (44.4)	100 (50.5)		
Quality service	0 (0)	12 (6.1)	97 (49.0)	89 (44.9)		
Fare affordability	0 (0)	15 (7.6)	117 (59.1)	66 (33.3)		
Learning						
Self-experience	5 (2.5)	36 (18.2)	106 (53.5)	51 (25.8)	0.000*	11.385
Other people's experiences	16 (8.1)	114 (57.6)	52 (26.3)	16 (8.1)		
	42 (21.2)	110 (55.6)	30 (15.2)	16 (8.1)		
Social						
Reference group	43 (21.7)	95 (48.0)	44 (22.2)	16 (8.1)	0.193	1.267
Role of friends or relatives	17 (8.6)	47 (23.7)	91 (46.0)	43 (21.7)		
Role of health influencers	9 (4.5)	55 (27.8)	90 (45.5)	44 (22.2)		
Family						
Parents role	13 (6.6)	36 (18.2)	39 (19.7)	110 (55.6)	0.003*	2.263
Siblings role	22 (11.1)	62 (31.3)	71 (35.9)	43 (21.7)		
	20 (10.1)	51 (25.8)	87 (43.9)	40 (20.2)		

Note: *p<0.05, significant; 1: very low; 2: common; 3: high; 4: very high

Psychological factors that influence respondents' decisions to use telemedicine are learning that does not only come from personal experiences or experiences of others. The results showed that learning influenced the decision to use telemedicine services (p=0.000). This is in line with previous research, which states that learning from experience can influence consumers to take advantage of technological developments in health; other studies also say that the experiences of individuals and others influence decisions and acceptance of telemedicine services.²⁸

Family social factors have a significant influence on consumer decisions in using telemedicine services (p=0.003). Family members who have used telemedicine services substantially impact consumers' intentions to participate in using them in the future.²⁹ Family support also affects consumer acceptance of technological developments through decisions on telemedicine services,³⁰ while the reference

group shows results that do not affect consumer decisions in telemedicine services (p=0.193). This is not in line with previous research, which stated that social groups or reference groups influenced consumers to use telemedicine services.³¹ However, this could be because, during the research period, consumer interactions with reference groups due to social distance very analysis results analysis showed no influence on consumer decision-making. In this study, telemedicine or other health care technologies developers understand consumer purchasing decisions' behavioral characteristics. They can also direct the promotion of telemedicine services according to the aspect of consumers so that their use continues in the long term.

This research has some limitations in the process. First, this study is based on cross-sectional data collected from individual surveys. So it still requires further longitudinal field studies in the future to determine the decision

to use long-term telemedicine. Second, the limitation of this study is that it does not consider other psychosocial factors that may influence the decision to use telemedicine. Other psychosocial factors that can still be investigated are lifestyle, personality, and consumer attitudes. Third, because this study was conducted in a specific population, these needed to be more may not be generalizable to other people with healthcare health care policies and systems.

Conclusions

This study reveals that psychosocial factors such as motivation, perception, learning, and family influence individual decisions to use telemedicine services. Meanwhile, the reference group has no significant effect.

Conflict of Interest

There is no conflict of interest in this article.

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