



Integrated Social Cognitive and Social Capital Theory Toward Telemedicine Acceptance During Pandemic Turbulence

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Abstract

Purpose: This paper investigates the acceptance of telemedicine during the COVID-19 pandemic using an integrated framework of social cognitive theory, social capital, and the Technology Acceptance Model (TAM).

Method: The research employs a quantitative method through online surveys. The findings indicate that: 1) Self-efficacy is associated with the perception of ease of use of telemedicine. 2) Social capital is related to both the perceived ease of use and usefulness of telemedicine. 3) The turbulent pandemic situation strengthens the intention to use telemedicine. This study collect 155 respondents and use partial least square for testing hypothesis.

Result: All of hypothesis in this research are supported. The results suggests that the implementation of telemedicine should consider social capital, social cognitive aspects, and TAM.

INTRODUCTION

The use of telemedicine is currently increasing (Jnr, 2020), especially since the 2020 pandemic (Bestsenny et al., 2021). In Indonesia, during the COVID-19 pandemic, telemedicine was reported to have increased by 600% (Bisnisnews, 2020). Telemedicine increased during pandemics due to several things, such as restrictions on hospital visits and direct interactions outside the home. Telemedicine is critical globally (Smith et al., 2020). In addition, it turns out that in the absence of a pandemic, telemedicine has also increased due to the distribution of health facilities, especially in rural areas. Telemedicine was introduced in the 1960s by utilizing IATV for medical services (Wittson et al., 1961). Then, it developed into telemedicine with various features, which it has today. Telemedicine is a broad category of technology and clinical applications that employ the Internet to send medical information (Perednia & Allen, 1995). Telemedicine applications can be divided into three categories: teleconsultation, teliagnosis, and tele-education. Telemedicine is helpful in several situations: 1) the limitation of direct interaction between patient and physician, 2) long distances between health service providers and patients, 3) the availability of information that must be provided in an immediate time, and 4) means of mass disseminating information directly (Perednia & Allen, 1995).

Many scholars have studied telemedicine and the elements that influence telemedicine acceptability. Research by Hu et al. (1999) related to the acceptance of telemedicine using the technology acceptance model (TAM) from the patient side. In comparison, Rahimpour et al. (2008) investigated the reception of telemedicine with TAM from the patient's side. This study shows that TAM affects a person's intention and behavior when using telemedicine. While research that considers social aspects, namely social capital and social cognitive, is carried out in the context of the telehealth system, Tsai (2014) states that social capital influences telehealth adoption in terms of perceived usefulness and perceived ease of use. Still, social cognitive affects perceived ease of use. Previous research has not considered the conditions of pandemic turbulence. This study aims to look at the use of telemedicine in more detail and more comprehensively by considering TAM and social aspects as well as the conditions of pandemic turbulence as a moderator so that it can be known comprehensively what the determination of the use of telemedicine in unstable situations such as during a pandemic. This study aims to determine the acceptance of telemedicine using TAM with the integration theory of social cognitive and social capital during pandemic turbulence.

Telemedicine

Telemedicine is an IT-based innovation that can increase healthcare organizations' competitiveness while supporting and enhancing medical care. The telemedicine concept arose about four decades ago, when basic pioneering projects were in the works, motivated by futuristic quests that mainly focused on proving or feasibility review (Wittson et al., 1961). However, the majority of early telemedicine attempts fell short of expectations. Early financing termination, fledgling and generally basic IT infrastructure, immature technology, and inefficient technology use were among the issues (Brancheau et al., 1996). The failure of the first-generation telemedicine programs emphasized the importance of analysis and thorough review of the numerous technological, cultural, social, and organizational factors that come with telemedicine implementation. User acceptance technology is a critical organizational barrier for healthcare organizations considering or preparing to offer telemedicine-enabled healthcare services (Brancheau et al., 1996). Telemedicine is also known as telehealth, and both terms refer to the same thing: remote data exchange between a patient and physician, with different places in the patient's home and healthcare institution (Hendy & Barlow, 2012). Telemedicine has more complex features, consisting of prevention, diagnosis, treatment, and education to promotion of medical things. Telemedicine can interconnect in different regions and be used during disasters, according to the NATO Multinational Telemedicine System, backed by guidelines and technology development (Doarn et al., 2018).

Technology Acceptance Model (TAM)

TAM is the mature theory that Davis et al. (1989) developed and serves as a theoretical foundation for investigating technology acceptance (Adams et al., 1992). TAM is a theory that describes how users accept technology based on perceived ease of use and usefulness (Hu et al., 1999). Perceived ease of use refers to perceiving how easy it would be to utilize a particular system (Davis, 1985). "The absence of difficulty or major effort" is how "ease" is defined. "Effort is a finite resource that must be divided among the many duties for which a person is responsible." At the same time, perceived usefulness refers to "the degree of improving job performance using a particular system" (Davis, 1985).

Social Cognitive and TAM

The theoretical concept of Social Cognitive Theory (SCT) is about human thought, desire, motivation, and action, which adopt the causality interaction model in which cognition and behavior, other personal elements, as well as external influences, interact as determinants that affect both directions (Bandura, 2014; Shu et al., 2011). Self-efficacy impacts what people choose to do, how

much work they are willing to put in, and how long it takes them to overcome hurdles (Bandura, 2014; Hasan, 2007). according to SCT, self-efficacy is an essential component of a person's task performance and has been connected to several psychological and behavioral effects in various psychosocial activities (Bandura, 2014; Shu et al., 2011).

Self-efficacy has been proven crucial in consumers' perceptions of computer/information technology (Bandura, 2014). According to Compeau and Higgins (Compeau & Higgins, 1995), the basic notion of computer self-efficacy is defined as "people's assessments of their skills to run a computer system successfully." According to Rahimpour et al. (2008), system self-efficacy is genuinely relevant and should be linked with TAM to develop a more comprehensive model framework for analyzing telemedicine acceptance. According to Venkatesh (Venkatesh, 2000) and Davis (Davis, 1985), the user's perception of the ease of use of the system is based on people's belief in the ability to use computer technology (i.e., system self-efficacy).

Direct involvement with the system is needed to build perceptions about the more tangible characteristics of a system. Whereas before direct experience, system self-efficacy was a significant factor in telemedicine's perceived ease of use (Rahimpour et al., 2008). Tsai (2014) reinforces this view by stating that boosting self-efficacy through training and continuous support is essential for improving the acceptance and usage of telehealth technology. Users who feel confident and capable tend to find the technology more straightforward. Moreover, Thong et al. (2002) and Wu et al. (2007) propose that self-efficacy influences behavioral intention via perceived ease of use and perceived usefulness, with the hypothesis that self-efficacy significantly affects both PEOU and PU in telemedicine.

H1: Self-efficacy positively impacts perceived ease of use.

H2: Self-efficacy positively impacts perceived usefulness.

Social Capital and TAM

According to Bourdieu (Bourdieu, 2011), social capital is the actual or potential resource linked with long-term networks of mutual acquaintance or recognition. Coleman (Coleman, 1994) stated that the "social capital" concept refers to various aspects of a social organization that promotes specific actions by persons. Social capital is concerned with an individual's physical and emotional well-being and interpersonal relationships. Social capital is a social structure that facilitates specific individual acts that benefit individuals and organizations (Coleman, 1994; Putnam et al., 1993). It primarily focuses on interpersonal relationships (Felicio et al., 2012). Social capital has the following characteristics: (1) long-term asset, (2) "feasible" and "changeable," (3) can be used to replace or supplement other resources, (4) requires maintenance, and (5) some types are "community goods" (Adler & Kwon, 2002).

According to Tsai (2014), social capital influences users' acceptance of the ease and usefulness of their technology. Suppose they believe that technology makes them prefer to accept the technology. Tsai (2014) also found that social capital theory, including social trust, institutional trust, and social participation, positively influences perceptions of technology's ease of use and usefulness, which can be promoted through personal interactions and equal doctor-patient relationships, fostering greater engagement with telehealth technology. Rianawati et al. (2023) further corroborated that individuals' inclination and readiness to embrace technology, particularly during pandemics, are influenced by social capital and social efficacy, underscoring the significance of social network structure in shaping attitudes towards the adoption of telemedicine. Therefore, understanding and utilizing social capital and social efficacy can aid in effectively incorporating telemedicine, particularly during periods of emergency.

H3: Social capital positively impacts perceived ease of use.

H4: Social capital positively impacts perceived usefulness.

H5: Perceived ease of use positively impacts attitude.

H6: Perceived usefulness positively impacts attitude.

H7: Attitude positively impacts intention to use.

Pandemic Turbulence

Turbulence is a period indicated by high uncertainty, rapid changing, inconsistent, unexpected, or unpredictable events, and demands, sometimes called when the “ground is in motion” (Emery & Trist, 1965). Ansell (2016) states turbulence is "a situation in which events, needs, and assistance interact and vary in extremely variable, inconsistent, unexpected, or unplanned ways." Turbulent is referred to as chaos since it demonstrates disorder and uncertainty. It's happened due to the pandemic (Lemoine et al., 2020). Turbulence can result in surprises, instability, fast and changeable operating strategies, conflicting demands, and uncertainty (Ansell & Boin, 2017). Turbulence during the COVID-19 pandemic alters people's intentions and preferences when picking something, mainly because of the direct interaction and safety. The COVID-19 pandemic has changed the role of life and daily activity. Sudaryono et al. (2023) demonstrated that the pandemic-induced disruption moderates the relationship between attitudes toward the TAM and the intention to use telemedicine. Amid the COVID-19 crisis, increased dependence on telemedicine brands for essential remote healthcare services influences individuals' TAM attitudes, affecting their propensity to embrace telemedicine. H8: The association between attitude and intention to use is strengthened by pandemic turbulence.

RESEARCH METHODS

This study aims to investigate telemedicine acceptance using the integrated theory of social cognitive and social capital, employing a quantitative method to analyze hypotheses. The focus is to examine the acceptance of telemedicine utilizing TAM theory and integrating social cognitive and social capital in a turbulent situation during the COVID-19 pandemic. Respondents who are telemedicine users, including both patients and physicians, were targeted. Data was collected through an online survey distributed via popular social media platforms such as WhatsApp, Facebook, and Line, chosen due to their widespread usage among Indonesians. The collected data comprised 186 responses from various regions and backgrounds in Indonesia. However, only 155 valid records remained after data cleaning, with 31 records eliminated due to data duplication, incompleteness, and failure to meet criteria. Despite efforts to ensure data quality, the research methodology faces several limitations, including potential sampling biases inherent in online survey methods, reliance on self-reported data, and constraints associated with cross-sectional survey designs, which could impede the generalizability of findings. Table 1 shows the specific characteristics of the respondents.

Table 1.
Characteristic of Respondent

Characteristic		Total	Percentage
Gender	Man	44	28%
	Woman	111	72%
User status	Physician	71	46%
	Patient	84	54%
Age	18-30	71	46%
	31-50	69	45%
	>= 51	15	10%

The measurements of the variables are based on past research. Social cognitive was adopted from Compeau & Higgins (1995) using eight items. Social capital measurement was acquired from Mohseni & Lindstrom (2007) using five items. The TAM variable was derived from Hu et al. (1999) and consists of six items of perceived ease of use, six items of perceived usefulness, three items of attitude use, and six items of intention to use. The moderator variable of pandemic turbulence was derived from Garretson et al. (2021). The questionnaire was directly distributed to the sample

population that met the predetermined criteria without undergoing any revision process. Additionally, this study includes a respondent profile to collect demographic information consisting of gender, user status, and age. The hypothesis in this study was examined using structural equation modeling (SEM), multivariate analysis testing, and SmartPLS for statistical programming. Nevertheless, several questionnaire indicators were eliminated because they did not meet the criteria set by Nasirun et al. (2021) and Hair et al. (2019).

RESULTS & DISCUSSION

The measurement model results show that all item loading values, construct reliability using composite reliability (CR), and convergent validity using average variance extract (AVE) meet the standards with values above the threshold of 0.6 as established. Detailed results of validity and reliability can be seen in Table 2.

This study has nine hypotheses, and the result shows that all the hypotheses are supported with different alpha significance (can be seen in Figure 1). H1, self-efficacy to perceived ease of use, and H2, self-efficacy to perceived usefulness, are supported by 10% of alpha significance. H3, social capital to perceived ease of use, and H4, social capital to perceived usefulness, are supported by 0,1% alpha significance. Continuing to H5 and H6, perceived ease of use and perceived usefulness to attitude are supported at a significance level of 0,1%. H7, attitude to intention to use telemedicine also endorsed in the 0,1% level significance. The last hypothesis, H8, is the indirect effect, moderating pandemic turbulence in the relationship between attitude and intention to use. The results show that moderating pandemic turbulence strengthens the relationship between attitude and intention to use at a significance level of 10%. Chi-Square, NFI, and R2 measure the model fit. Chi-Square is 1010,622; NFI shows 0,736. While R2 can be seen in each construct in Figure 1, R2 shows a good result, with the lowest R2 being 40%. This means that all construct is a reasonable determination.

The results of this study indicate that self-efficacy has a significant positive impact on the perceived ease of use of telemedicine. Self-efficacy can influence an individual's confidence level to overcome specific situations. In telemedicine, individuals with high self-efficacy are more likely to believe they can use telemedicine technology effectively and communicate with healthcare providers through the platform. This can reduce anxiety or uncertainty that may arise when using new technology. These findings are consistent with previous research by Agourram (2019), where the researchers stated that high self-efficacy tends to lead to successful acceptance and use of technology.

Furthermore, this research indicates that social cognitive and social capital influence technology acceptance. This means that the relationship, the belief, and the structural capital become the consideration of people in accepting technology (Tsai, 2014). Social cognitive means that in receiving technology, people consider the meaning, experience, and information of what they understand. For this reason, the provider or developer needs to explain the meaning and knowledge of telemedicine clearly. This supports the previous paper from Tsai, (2014) and Rahimpour et al.(2008).

The attitude of people influences the intention to use telemedicine, and the acceptance behavior of a person affects a person's intention to use a technology (Hu et al., 1999; Tsai, 2014). This follows many studies related to the intention to use telemedicine, which is influenced by user technology acceptance (Hu et al., 1999; Rahimpour et al., 2008). An equally important point in this study is the indirect moderating effect of pandemic turbulence, which shows that pandemic turbulence strengthens the relationship between attitude and intention to use telemedicine. This means that unstable conditions or chaotic situations will make someone more willing to use telemedicine. This is in line with the phenomenon that increased the use of telemedicine during the COVID-19 pandemic (Jnr, 2020). This was related to several things, such as restrictions on direct interaction due to unstable

Table 2.
Validity and Reliability testing result

Construct	Items	Loading	CR	AVE
Social Capital	SCp1	0,923	0,754	0,615
	SCp2	Deleted		
	SCp3	0,614		
	SCp4	Deleted		
	SCp5	Deleted		
Self-Efficacy	SEf1	0,841	0,957	0,735
	SEf2	0,850		
	SEf3	0,774		
	SEf4	0,918		
	SEf5	0,843		
	SEf6	0,892		
	SEf7	0,871		
	SEf8	0,861		
Perceived Ease of Use	PEoU1	Deleted	0,855	0,664
	PEoU2	0,856		
	PEoU3	0,845		
	PEoU4	0,739		
	PEoU5	Deleted		
Perceived Usefulness	PU1	0,848	0,898	0,689
	PU2	Deleted		
	PU3	0,840		
	PU4	Deleted		
	PU5	0,888		
	PU6	0,737		
Attitude	Atd1	0,912	0,893	0,738
	Atd2	0,723		
	Atd3	0,927		
Intention to Use	IU1	0,891	0,919	0,739
	IU2	0,889		
	IU3	Deleted		
	IU4	Deleted		
	IU5	0,814		
	IU6	0,842		
Pandemic Turbulence	PT1	0,882	0,929	0,766
	PT2	0,935		
	PT3	0,816		
	PT4	0,865		

conditions and the risk of exposure to the deadly COVID-19 virus. So that the use of telemedicine is increasing because people choose to stay at home and interact using digital media and social media. Based on research by (Darr et al., 2020) in England and (Al-Sofiani et al., 2021) in Saudi Arabia,

telemedicine services produced high patient satisfaction during the pandemic. Research conducted in England also showed that 99% of patients were satisfied and very satisfied with telemedicine services, and 210 out of 300 patients using telemedicine expressed a similar level of satisfaction.

Construct reliability and validity were measured by composite reliability (CR) and average variance extracted (AVE), while discriminant validity was calculated using the Fornell-Lacker Criterion. The result was satisfied in all constructs (Table 3).

Table 3.
Discriminant Validity

	Atd	IU	PEoU	PT	Pus	SCp	SEf
Atd	0,859						
IU	0,801	0,860					
PEoU	0,738	0,730	0,815				
PT	0,189	0,179	0,069	0,875			
Pus	0,781	0,799	0,753	0,193	0,830		
SCp	0,602	0,617	0,628	0,206	0,643	0,784	
SEf	0,385	0,408	0,387	0,116	0,433	0,402	0,857

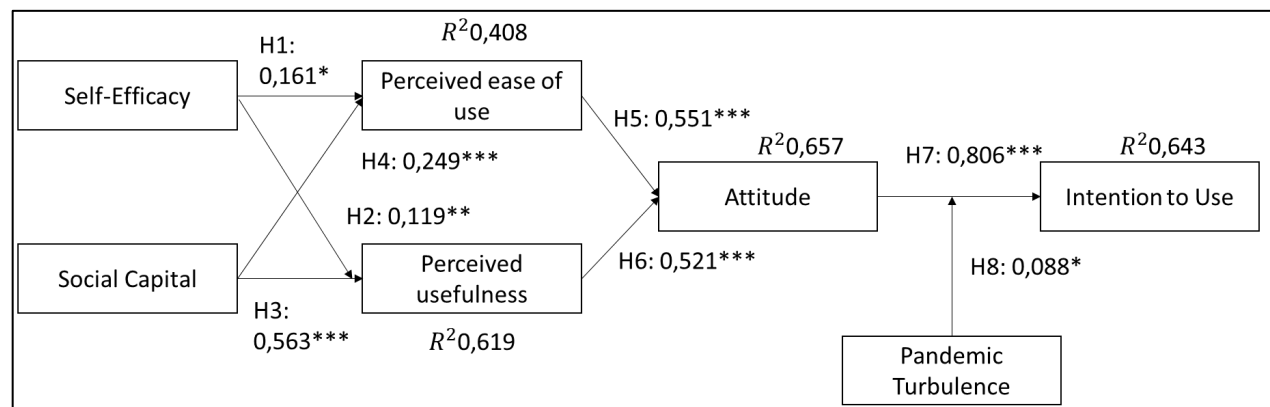


Figure 1.
Hypotheses Testing Result

CONCLUSION

The study aims to deepen the understanding of user acceptance of telemedicine using the integrated theory of social cognitive and social capital in a pandemic turbulence situation. Peneliti employed a quantitative online survey to analyze nine hypotheses, with 155 respondents indicating that the acceptance of telemedicine, as evaluated by the Technology Acceptance Model (TAM), is influenced by social cognitive and social capital factors in turbulent conditions. This finding suggests that social factors, represented by social capital and social cognitive elements, significantly impact people's acceptance of technology. The study's salient finding is the moderating effect of pandemic turbulence, which strengthens the relationship between attitude and intention to use telemedicine, highlighting that in unstable and chaotic conditions, people are more inclined to use technology due to security and safety concerns when interacting traditionally (Garretson et al., 2021). This telemedicine preference underscores social factors' role in technology acceptance (Jnr, 2020).

While the study reveals significant findings, it also notes a drawback: the lack of mediation analysis, which could be included in future research to provide more comprehensive results. Future studies could explore the mediation of attitudes between perceived ease of use, perceived usefulness,

and intention to use and incorporate additional social factors beyond social cognitive and social capital. The theoretical contribution of this study is its addition to the literature on acceptance theory with social factors in turbulent conditions. Moreover, its practical contribution lies in advising telemedicine providers and developers to consider social factors and environmental conditions, such as pandemic turbulence, when implementing and developing telemedicine services.

The research suggests that future studies should include mediation analysis to comprehensively explore the relationships between attitude, perceived ease of use, perceived usefulness, and intention to use telemedicine. Telemedicine providers and developers are advised to consider social and environmental factors when designing services to boost user acceptance and market expansion, highlighting significant economic and commercial impacts. Academics and educators can update curricula to emphasize the role of social factors in technology acceptance, preparing future professionals for related challenges. Policymakers can foster telemedicine acceptance by strengthening social capital, considering social cognitive factors, and creating supportive environments. The study's findings, particularly the moderating effect of pandemic turbulence on the relationship between attitude and intention to use telemedicine, suggest a societal shift towards greater reliance on technology during crises, with long-term implications for healthcare delivery and public health strategies.

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