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Factor Influencing of Telehealth Acceptance During COVID-19 Outbreak: Extending UTAUT Model

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Abstract: Telehealth has become an emerging technology since they offer remote healthcare services for infected patients or those who are worried about being infected. Furthermore, Telehealth can provide routine care without the risk of contracting Covid-19. Although Telehealth offers many potential benefits, the challenge was to encourage people to use them. Research related to Telehealth adoption in Indonesia is still limited, so there is still a lack of understanding regarding their behavior intentions in using Telehealth. One of the most widely used theories to explain Telehealth adoption is the Unified Theory of Acceptance and Use of Technology (UTAUT). However, doctors' opinion and computer anxiety variables have never been applied in the UTAUT model to analyze Telehealth use behavior, especially for cases in Indonesia during the Covid-19 outbreak. In addition, many researchers point out the importance of both variables in the healthcare context increasing the need for examining this feature. This paper discusses it for the first time. The survey was conducted by distributing online questionnaires via Google Docs to 118 Indonesian respondents who have used Telehealth. The results show that performance expectancy, effort expectancy, and facilitating conditions significantly affect behavior intention to use Telehealth. Social Influence is not significantly associated with behavioral intention since early adopters are considered reluctant to other views. Moreover, performance expectancy is significantly affected by doctor's opinions and effort expectancy is strongly influenced by computer anxiety.

Keywords: UTAUT, Telehealth, Doctor opinion, Computer anxiety, Covid-19.

1. Introduction

The coronavirus disease, which is called the WHO (World Health Organization) as the 2019 new coronavirus (2019-nCov), was first discovered in Wuhan affected by the Severe Acute Respiratory Syndrome Coronavirus-2 (SARS-CoV-2) virus. The spread of the Covid-19 virus is so fast through human-to-human transmission in a short time that it has infected more than 216 countries worldwide. Therefore, starting March 11, 2020, WHO has declared it a pandemic [1]. Based on WHO's latest data (12/17/2020), the ongoing Covid-19 pandemic has affected more than 70 million confirmed global cases and 1.6 million deaths globally, resulting in turbulence in human economic and societal life on a large and comprehensive scale [2].

A pandemic call for the importance of breaking the chain of transmission and protecting populations from risk. Therefore, many countries have implemented various policies ranging from lockdown, physical distancing to an individual and regional quarantine. The government of Indonesia has determined the regional quarantine as a restriction policy since the individual quarantine was considered less effective in breaking the virus's chain during a pandemic [3]. This policy has affected the activities of the society such as transportation, education, religion, social, and culture in a region accused of

becoming contaminated by Covid-19, to avoid the transmission of the virus [4, 5].

Before the covid-19 pandemic, various IT-based tools were developed and utilized by users such as e-learning, e-government, e-commerce, e-health, etc. But after the pandemic, the use of tools has become more intensive and increasingly popular because people are always looking for innovative solutions to reduce the impact of the pandemic. In the health sector, Telehealth has become an interesting and rapidly developing issue, which shows an increasing interest in using it [6].

Telehealth research has begun to develop which is indicated by the increasing number of related publications. However, there remains the problem of why people still use traditional healthcare services instead of moving to Telehealth [7–10]? According to [11], the human issues of both individual and organization level are the reasons contributing to the IT implementation failures. Thus, human factors will ultimately determine the success of IT applications. Furthermore, [11–14] has concluded that the socio-technical factors are essential to the success of Telehealth. [9, 10, 15] also categorized factors for IT failures such as ineffective communication, technology problems, low IT leadership, underestimation of complexity, transition costs, resistance to change and computer anxiety. Mostly in face of modern technologies, consumers can demonstrate uncertain and reluctant intention to embrace the technology as such it applies to personal safety. Consumers are still hesitant to apply Telehealth in their daily life. Latest surveys have also shown that people may not truly trust in the promise of Telehealth [16–18]. The potential of IT applications is constrained not only by the capabilities of state-of-the-art technologies, but it is often calculated primarily by the degree of acceptance level by consumers. Therefore, the ability to identify, to predict, and to manage the users' acceptance is very critical to the success of healthcare IT applications [16].

However, existing literatures that discuss how users perceived Telehealth or using Telehealth is still limited [10, 16, 19]. To our knowledge, there has been no research conducted on the acceptance of Telehealth users, especially for cases in Indonesia during the Covid-19 outbreak.

Furthermore, Covid-19 makes the concept and implementation of Telehealth increasingly urgent to be realized quickly; psychical distancing protocol and the large number of medical personnel in Indonesia who are positively infected by Covid-19 is the right and rational reason to make telehealth the principal thing; one of them is to keep the virus from spreading easily.

Regarding the urgency of Telehealth during the Covid-19 Pandemic, Indonesia is one of the countries that are important to be studied due to two reasons. First, the death rate of Indonesia (4.3%) is higher than the global death rate (3.4%) [20]. Second, the trend of Covid-19 cases in Indonesia still increases; When other countries start to prepare themselves to face the second wave of a pandemic of coronavirus, Indonesia still suffers in responding to the first wave. it is caused by the response in handling the pandemic that is not optimal yet [21].

For Telehealth to be an effective solution, patients must be encouraged to use them. Previous studies have confirmed that Telehealth usage depended on intention to use them [9–11, 15]. Therefore, studies regarding the intention to use Telehealth become important.

Various considerations have been put forward e.g., clinical, legal, and social issues are also rational reasons why telehealth can be used as a new strategy and innovation to provide adequate health services [8]. The research done by [10] uses UTAUT's point of view regarding the conceptual Telehealth from the aspect of consideration of experience using technology devices, lifestyle, cost appropriateness ratios, social factors, and other consideration aspects in the use of technology.

Unfortunately, the theoretical research published by [8, 10] only confirms the telehealth designation from the aspect and the reasons for end-users to use a telehealth technology device without providing any other confirmation in the form of data protection, the accuracy of health service data and doctor’s opinion as rational reasons to accommodate a more comprehensive telehealth concept. Therefore, as part of this state of the art and novelty study, we add the variable, namely doctor’s opinion and computer anxiety, as antecedent variables to strengthen the UTAUT concept in the Telehealth context. We believe that the pressure to get medical services during this pandemic also increases; the public's curiosity about health during a pandemic has also increased. The urgency of the doctor's opinion variable is also essential for us to include in our study, considering that health problems cannot be practical without the support of a doctor's opinion as well as to complement the UTAUT approach (e.g., performance, effort expectancy, facilitating conditions, and social influence) from the perspective of health technology.

Our study objective is to build and develop new concepts in empirical research models about behavior intention to use Telehealth in connection with the

reviews that we have made. Therefore, to bridge these goals, we propose new concepts, namely doctor's opinion and computer anxiety as antecedent variables to invest their role in the UTAUT model as an intervening variable and behavior intention to use Telehealth as the dependent variable (Fig. 1); of course, through direct and indirect role investigations. We believe this study to be the first to develop and test an integrated model of UTAUT, doctors' opinion and computer anxiety for explaining users' intention to use Telehealth in Indonesia.

This research is organized as follows: Section 2 provides a theoretical background and hypotheses development. Section 3 presented the methodology and, followed by section 4, shows the study's results or findings. The discussion of results is presented in section 5. The final section draws a conclusion of this research followed by the limitations and further research.

2. Literature review

2.1 Telehealth

Telehealth, or another term Telemedicine is the use of ICT to provide long-distance health services. The two terms are often interchangeable. However, Telehealth refers to the services of healthcare that cover all professions and health education for the public. In contrast, Telemedicine refers to doctors' health services, especially the monitoring activities and clinical diagnosis by using technology [6]. Basically, Telehealth is an extension of Telemedicine [22]. Telehealth practice has developed not only in diagnosis and monitoring but also education aspect provided through applications, video conferencing, or mobile devices [23, 24]. In this study generally, Telehealth's terminology is all forms of IT-based health services [6].

The primary motivation to adopt Telehealth was to provide healthcare solutions for remote areas. Equity and affordability of health services is still an obstacle where health facilities are not fully accessible to the community. Telehealth is used to increase public access to health services that do not yet exist or are still limited [23]. For example, in India, Telehealth connects all hospitals, including small hospitals in villages [25]. Telehealth established remote treatment units in large hospitals that have experts who are handled directly by doctors. In India, doctors or nurses in remote villages can conduct remote consultations by using teleconferencing systems with specialist doctors in India's major hospitals [25]. If more in-depth treatment is needed, then the patient is referred to a large and comprehensive hospital. Telehealth can also increase doctors' and nurses' knowledge in remote villages by transferring knowledge formed because there is an element of education in it.

However, the use of Telehealth to improve health services is more concentrated in developed countries than developing countries [26]. Most professional specializations, including radiology, dermatology, anatomy and psychology have utilized Telehealth more often than others [26]. However, the development of the Internet and advances in technology such as mobile devices have increasingly opened up Telehealth opportunities to be used more widely at a more affordable cost [8]. The Telehealth concept is increasingly relevant to the Covid-19 pandemic because of the need to carry out regional quarantine to decide the spread of coronavirus and protect both patients and medical personnel.

2.2 Theoretical background

Research on Telehealth usage has been performed by several researchers, but current works of literature are still limited as Telehealth usage arises worldwide [10, 16, 27]. For example, research conducted by [10] determined the factors that influence the customer's intention of using Telehealth via the extension of TAM (Technology Acceptance Model) with other constructs. This study included adolescents beyond 40 years old at risk of developing a chronic infection as research participants. They found that the perceived usefulness and computer anxiety are critical factors for Telehealth acceptance and use in Taiwan. Moreover, the respondents agree that Telehealth can help individuals to improve their health quality through a healthy self-management system. Kijsanayotin, Pannarunothai, & Speedie (2009) investigated the community health centers (CHC) in Thailand to analyze the reason people accept and use Telehealth systems. The UTAUT (Unified Theory of Acceptance and Use of Technology) framework was used as a theoretical foundation to assess six factors such as performance expectancy, effort expectancy, social influence, facilitating conditions, voluntariness and user experience within the model. Their results reveal the importance of those variables in Telehealth acceptance in developing countries [11].

On the other hand, Nature, Hoque, Hu, & Barua (2020) analyze the determinants impacting the uptake of mobile health in Bangladesh utilizing the expanded UTAUT model with price value and perceived reliability constructs [28]. They found that performance expectancy, social influence, facilitating conditions, and perceived reliability have

a significant impact on the behavior intention to use mobile health services. Effort expectancy and price value, nevertheless, have no impact on the behavioral intention in Bangladesh as a developing country. [16] empirically tested the UTAUT model to study the factors influencing the hospital information system (HIS) among personnel departments including the medical, nurse, and administrative personnel in the Greek hospitals. They found that perceived usefulness, perceived ease of use, social influence, attitude, facilitating conditions, and self-efficacy significantly influence the users' behavioral intention. Most studies related to users' behavior and decision-making in Telehealth acceptance present the main challenge in successful Telehealth adoption.

Recent studies show that computer anxiety keeps playing an important role in the usage and adoption of healthcare technologies. [16] analyze the effect of computer anxiety on each construct of UTAUT. [18] found that computer anxiety is the underlying barrier to the acceptance of healthcare information technology (HIT). A similar study incorporated anxiety as an inhibitor to explain physicians' intention to use HIT [29, 30]. Furthermore, [31] investigated the relationship between anxiety and effort expectancy. All studies above reported the importance and significance of computer anxiety.

Physicians' role, such as doctor has been explored by researchers since physicians are considered an expert domain. Based on [32] research, most patients relied heavily on their physicians' preferences. [33] reported that physicians' and patients' relationships are asymmetrical, where doctors have considerably more knowledge on medical problems unlike the patients. Thus, the patients believe the doctor knows the best for their healthcare. Recommendations of the physicians' have also played a crucial role in the management of preventive health care and the access to the Internet as a conduit for diagnostic knowledge [27]. In the area of health care, people prefer to delegate their actions to the medical authority. In addition, the viewpoint of physicians affects the users' acceptance through perceived usefulness [34].

Based on the review of the previous studies, the UTAUT model has become the leading theory that could explain user behavior toward potential rejection or acceptance in the healthcare context , [11, 16, 27, 28]. Several factors were found significantly associated with the acceptance and use of Telehealth. The main factors are derived from the UTAUT model, showing that Telehealth usage is influenced by performance expectancy, effort expectancy, social influence and facilitating conditions [10, 11, 16, 28]. Besides, Telehealth acceptance is also influenced by contextual factors such as computer anxiety [10, 18], self-efficacy significantly [16], voluntariness and user experience [11], and perceived reliability [28] and doctors' opinion [27, 34].

Although the studies of Telehealth usage have been carried out, however there is a lack of research that examined the simultaneous effect of performance expectancy, effort expectancy, social influence, facilitating conditions, doctors' opinion and computer anxiety on behavioral intention to use Telehealth.

2.3 Research model & hypotheses development

In this study, The UTAUT model has been considered as a fundamental theory for designing the study method to analyze users' perception of Telehealth related to a novelty in technology acceptance studies in the healthcare sector. Fig. 1 represents a research model showing the use of Telehealth and the hypothesized proposed. In this study, the UTAUT model as baseline theory was developed and empirically tested along with other constructs: PE (Performance Expectancy), EE (Effort Expectancy), SI (Social Influence), FC (Facilitating Conditions), DO (Doctor's Opinions), and CA (Computer Anxiety).

The constructs, namely doctor's opinions and computer anxiety, were added in the proposed model since many researchers reveal the importance of both constructs, especially in the healthcare context [16, 29, 32, 34]. Thus, the application of them reveals the necessity of examining this feature. The importance of all constructs discussed in the previous section will be adapted into the Telehealth context. In this study, we also follow the previous studies to exclude the moderating effect in the UTAUT original model (age, experience, gender and voluntariness to use) due to asymmetrical distribution [35, 36]. In this study, we divide the factors into two categories, UTAUT factors and contextual factors.

Recently, several UTAUT research models in the healthcare sector (e.g., [9–11, 37, 38]) present the UTAUT concept (i.e., performance expectancy, effort expectancy, social influence, and facilitating conditions) as the independent variable. The novelty presented in their previous research is, for example, in the aspects of individual psychology (self-efficacy) and cost-effectiveness [37]; task and technology characteristics [38]. However, no studies have specifically investigated the effect of doctor's opinion and computer anxiety variables on the intention to use Telehealth especially in the indonesian context, which is why we include these two variables (doctor's opinion and computer anxiety) in our proposed model to strengthen the

novelty of the research and develop UTAUT conventional model for the healthcare sector. To fill the literature gap, this research aims to examine the simultaneous effects of performance expectancy, effort expectancy, social influence, facilitating conditions, doctors' opinion and computer anxiety on the intention to use Telehealth.

Performance expectancy (PE)

Performance expectancy (PE) is defined as "the degree to which an individual believes that using the Information System (IS) will help him/her to attain job performance" [39]. Users would be more likely to embrace modern technologies if they believe this technology provides advantages and is more effective in their everyday lives. PE in Telehealth is indicative of the consumers' expectations of technology in a problem-solving setting. PE indicates the user's subjective assessment that using Telehealth will improve their health quality. [10] found that PE is the main factor that encourages individuals to adopt Telehealth services. Similarly, [40] reported that PE is a important determinant to predict the behavioral intention to use Telehealth. [41] reported that PE has a direct effect on the intention to use Telehealth. According to [42], PE is an essential factor of the users' behavior intention to use Telehealth. Empirically, they have shown that the higher the PE, the more probable Telehealth systems will be accepted. Thus, the following hypothesis has been proposed:

H1: Performance Expectancy has a significant effect on Behavioral Intention to Use Telehealth.

Effort expectancy (EE)

Effort expectancy (EE) is "The degree of ease associated with the use of the system" [39]. EE is also related to whether free of effort that the user pays attention to use a particular system. Effort expectancy is emphasized in the UTAUT model by [39] as a crucial component found in most Technology Acceptance studies and by [13] known as perceived ease of use in the model of TAM. In this analysis, EE represents the user's subjective assessment that Telehealth will be easy and effortless. EE is significantly related to behavioral intention since Telehealth is relatively new to the patients [28]. Users are typically related to devices that are easy and simple when used. EE has also been determined as an essential predictor of users' intention to use healthcare technology [42]. An analysis of variables impacting users' adoption of telehealth technologies at Community Health Centers in Thailand showed that EE to be the main indicator of acceptance behavior [11]. Thus, the following hypothesis has been proposed:

H2: Effort Expectancy has a significant effect on Behavioral Intention to Use Telehealth.

Social influence (SI)

Social influence (SI) is "the extent to which an individual perceives that important others believe he or she should apply the new system" [39]. It means that individuals can adopt a new system because of other's views rather than their personal perceptions [43]. SI is linked to the impact of peer activities and thoughts on the individual's behavior. In this study, SI represents how a user perceives that others encourage them to use Telehealth. When other users try to use Telehealth and get many benefits from one, individuals will become more willing to use Telehealth.

Various studies were conducted to examine the effect of SI on users' acceptance, but their results are mixed. More precisely, social influence is considered negligible in physician-related decisions on the usage of Telehealth [44, 45]. On the other hand, [16, 42] found a significant relationship has been established between behavioral intention and SI on healthcare technologies usage. Thus, the following hypothesis has been developed:

H3: Social Influence has a significant effect on Behavioral Intention to Use Telehealth.

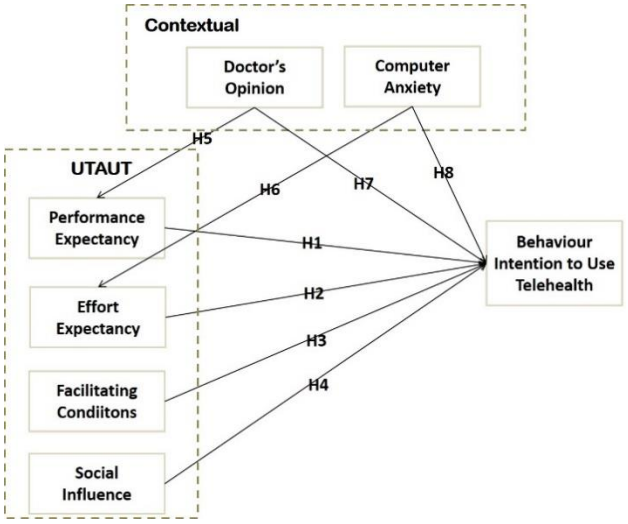

Figure. 1 Research model

Facilitating conditions (FC)

Facilitating conditions (FC) is defined as "the degree to which an individual believes that an organizational and technical infrastructure exists to support the use of the system" [39]. In this study, Telehealth as online healthcare technology needs Internet connection services and a computer/smartphone as resources to access. This illustrates how the function of ICT is a key element to be recognized when each individual does not have equitable access to information as well as other resources to obtain the benefit of Telehealth. [7] stated the vital position of infrastructure support on Healthcare Information Technology (HIT) usage. [16] reported that FC has a significant effect on the behavioral intention to use healthcare technology. Similarly, a study of HIT acceptance reported an increase in FC will increase the BI to use Telehealth [11]. A study conducted by [46] suggested that FC has affected HIT services' behavioral intention and use. Therefore, the following hypothesis has been developed:

H4: Facilitating Conditions have a significant effect on Behavioral Intention to Use Telehealth.

Doctor's Opinion (DO)

Doctor's Opinion (DO) is defined as a belief of users concerning the recommendation of a doctor as an expert authority in their healthcare services. In this study, Doctor's Opinion represents users' perception of whether they trust physicians for health advice to improve health quality through Telehealth. A survey of over 2,500 individuals seeking online medical advice showed that users are more inclined to trust a site if the perceived risk is low [47]. According to [48] research, healthcare technology systems' success depends on trust between the patients and physicians. Thus, an increase of trust in doctor's opinions will enhance technology's perception as useful [34]. [27] also found a strong relationship between DO and PE, where physicians' opinions affect behavioral intention to use Telehealth through performance expectancy. Furthermore, [49] analyze root cause of consumers of the Internet and indicated that trust in physician's advice is a central concern in the field of healthcare. Thus, the following hypothesis has been developed:

H5: Doctor's Opinion has a significant effect on Performance Expectancy.

H7: Doctor's Opinion has a significant effect on Behavioral Intention to Use Telehealth.

H9: Doctor's opinion has a significant effect on Behavioral Intention to Use Telehealth if the variables Performance Expectancy intervening the model

Computer anxiety (CA)

Computer Anxiety (CA) is described as "evoking anxious or emotional reactions when it comes to performing a behavior (using a computer)" [39]. In this research, computer anxiety reflects on users' understanding of their capacity and desire to utilize Telehealth. It is an emotional connection of the application of technologies and a detrimental impact on IT use. [16] suggested that computer anxiety affects effort expectancy. Similarly, [31] has investigated the relationship between anxiety and effort expectancy. The result shows a significant relationship where computer anxiety influences behavioral intention to use Telehealth through effort expectancy. [50] also confirmed that computer anxiety has a negative impact on behavioral intentions towards in service web-based e-learning through the perceived ease of use. In other terms, as anxiety increases, the individual perceptions of the ease of use of Telehealth will be diminished. Thus, CA is crucial to be addressed when analyzing how consumers embrace modern technological services or products since Telehealth is an emerging technology during this pandemic Covid-19. Thus, the following hypothesis has been developed:

H6: Computer Anxiety has a significant effect on Effort Expectancy.

H8: Computer Anxiety has a significant effect on on Behavioral Intention to Use Telehealth.

H10: Computer anxiety has a significant effect on Behavioral Intention to use telehealth if the variable Effort Expectancy intervening the model

3. Methods

In evaluating the theories implemented in the previous section, this study uses a self-administered questionnaires. The development of instrument and data collection are addressed in the following sections.

3.1 Instrument development

In this study, we have adapted the UTAUT model to measure the technology acceptance based on consumers' perspectives in Telehealth application. The original UTAUT was made under the organization environment and not for the health

industry. Thus, the following adaptations were conducted for each construct within the proposed model. The instrument consists of three parts; the first part is about explaining the aim of the research and a brief description of the Telehealth application. The second part includes the participants' demographic questions, while the last part represents the questions to measure the constructs of Technology acceptance in the research model. The instrument was designed based on a questionnaire survey that has seven constructs and twenty-one items according to the context of Telehealth. A four-point Likert scale was deployed in this questionnaire to measure the consumers' perspective regarding items, where 1=strongly disagree and 4=strongly agree [51, 52].

Table 1 presents the scale used in this study, where some adaptations were made regarding our research context. The original UTAUT constructs were driven by Venkatesh (2003) as a baseline theory of our research model. In this study, we also reviewed the literatures and scale used in the domain of Telehealth acceptance such as [11, 27, 28, 45, 47, 53–55]. Thus, referring to that literatures, we adapted the scale to measure Performance Expectancy, Effort Expectancy, Social Influence, and Facilitating Conditions as UTAUT constructs. The instrument adapted the Performance Expectancy and Effort Expectancy from [28, 47] while the constructs of Social Influence and Facilitating Conditions were adapted from [28, 54] as seen in Table 1. The Doctor's Opinion and Computer Anxiety as contextual constructs were adapted from [27, 28]. The role of Doctors' Opinion is vital in Telehealth application since most patients relied heavily on the recommendation or preferences of general practitioners for their healthcare [32].

Computer anxiety was found to be a critical factor that influences patient decision to use Telehealth technology [53, 56]. Computer anxiety was perceived as a significant barrier when people perform a specific task through information systems such as e-health [55]. The items of the scale were translated to the Indonesian language to access Indonesian users to prevent the effects of linguistic discrepancies. Before we distributed the instrument, we tested each question whether they were easy to understand, readable and not ambiguous.

This study's theoretical analysis uses a quantitative explanatory approach; we used path-model analysis as the analysis unit, then Smart-PLS and Sobel-Test as statistical testing tools. We use Smart-PLS because after we tested the normality of the data using the Kolmogorov-Smirnov method, it was stated that our data was not normally distributed, so that using PLS as a model testing tool was a rational reason. Furthermore, to obtain accurate data regarding intervening tests to analyze H9 and H10, we used the Sobel-Test.

This test's stages go through several phases, namely construct testing, e.g., outer loading, composite reliability, and AVE with a standard measurement of> 0.50 [57, 58]. The second phase is the Sobel Test to measure H9 and H10 for indirect effect; in the Sobel test measurement, we used the t_a methods and t_b [59]. Furthermore, testing the hypothesis by measuring the value t-statistics> 1.98 with a significance of $p < 0.05$.

3.2 Data collections

The data collection process was performed about two months in July-August 2020 by distributing online self-administered questionnaires through various social media such as Facebook, Twitter and Whatsapp. Thus, all respondents can fill the questionnaire without any assistance. The reason for considering social media is because it could be able to reach more users who may have adopted Telehealth applications especially in the era of covid-19 outbreak. In this study, convenience sampling was chosen as a sampling method. The instruments had been designed and distributed by using Google Docs and a total of 118 respondents have filled the survey. The demographics data can be summarized in Table 2.

The participants were distributed from 17 to 58 years old; the significant participants were male (69.5%), while female participants were only 30.5%. The majority of respondents who participate in this survey is young people with 17-27 years old (92%), while the most educational background is the bachelor degree (53%) and followed by high school (46%). After we collected the data, we conducted the data analysis by using SmartPLS software ver. 3.2.8. PLS-SEM was considered as explained because this study only had a few respondents and can overcome problems related to normally distributed data [60].

4. Results

The study used the PLS-SEM method to test the research model. The PLS-SEM was chosen since this approach has been widely used and has become the dominant approach, especially in the Information System (IS) field [61]. PLS-SEM's advantages have also been discussed extensively in many kinds of literatures such as its ability to predict or estimate the research model that uses small samples with no formative constructs within the same research model. In this study, we followed [64] research, where there

Table 1. Measurement instrument

Constructs	Items		Sources
Performance Expectancy (PE)	PE1	I find Telehealth highly useful in my life	[28], [47]
	PE2	Telehealth could enhance the level of convenience in accessing medical care services	
	PE3	Using Telehealth increase my capability to manage my health	
Effort Expectancy (EE)	EE1	I find using Telehealth would be simple	[28], [47]
	EE2	My interaction with Telehealth is clear and understandable	
	EE3	Learning how to use Telehealth is easy for me	
Social Influence (SI)	SI1	People who are important to me think that I should use Telehealth services	[28], [54]
	SI2	People who influence my behavior think that I should use Telehealth	
	SI3	People whose opinions that I value prefer that I use Telehealth	
Facilitating Conditions (FC)	FC1	I have the resources necessary to use Telehealth	[28], [54]
	FC2	I have the knowledge necessary to use Telehealth	
	FC3	I believe specific persons (or a group) will be available for assistance with system difficulties (technical support)	
Doctor Opinion (DO)	DO1	The doctor has a lot of experience and usually knows best	[27], [28], [54]
	DO2	I trust my doctor's judgment	
	DO3	The doctors' expertise makes him/her more likely to be right	
Computer Anxiety (CA)	CA1	Anyone can learn to use a computer if they are patient and motivated	[27], [28], [54]
	CA2	If given the opportunity, I would like to learn about and use computers	
	CA3	I hesitate to use a computer for fear of making mistakes	
Behavioral Intention (BI)	BI1	I intend to continue using Telehealth in the future	[28], [54]
	BI2	I will always try to use Telehealth in my daily life	
	BI3	I plan to continue to use Telehealth frequently	

are two main stages adopted in PLS-SEM to validate the philosophical construct and its related theories. The result of measurement model testing in the first stage is presented in section 4.1, while the result of structural model testing will be presented in section 4.2.

4.1 Measurement model

In the measurement model, we tested the validity and reliability of measured factors such as convergent validity, discriminant validity, and reliability. The criteria of convergent validity were determined by loading factor and AVE value. The discriminant validity was evaluated by using Fornell & Larcker criteria in this study [65]. The constructs' reliability was assessed based on Composite reliability (CR) values. CR has argued a better way to measure internal consistency than Cronbach alpha because it shows the manifest variables' standardized loadings [65].

Table 3 comprises the result of the measurement model, including descriptive analysis and outer loading. The descriptive analysis was presented based on each item's mean value and SD in the research model. The mean of items has a value range from 2.222 to 3.407, which indicates a moderate to high agreement level, meaning that overall respondents agreed about the constructs. The outer loading is the leading indicator of convergent validity with a minimum threshold value of 0.50 [64]. Thus, some items: SI2, SI3, CA1, CA2 and BI2 were deleted from the subsequent analysis since its factor loading was lower than 0.50. After we excluded those items, all outer loading factor values can obtain a satisfactory result (> 0.50). Besides outer-loading, the convergent validity was also assessed based on the average variance extracted (AVE). The result showed that each construct's AVE values have also met the minimum requirement because all constructs exceeded the criterion of 0.50 [64].

Finally, the discriminant validity was also supported in this study presented in Table 3. The Fornell & Larcker criterion compares AVE's value to the variance shared between a construct and others.

The discriminant validity was adequate since the square root of AVE of the corresponding construct exceeds the criterion (>0.50) than any correlation with another construct [65].

Table 2. Data demographic

Measurement	N=118	%
Gender		
Man	82	69.5
Woman	36	30.5
Age (years)		
17 – 27	109	92
28 – 38	6	5
39 – 49	1	1
50 – 60	2	2
> 60	0	0
Education level		
High School	55	46
Bachelor	62	53
Master	1	1
Doctoral	0	0

Moreover, the composite reliability (CR) for each construct exceeded the recommended threshold values (> 0.7). Since the outer loadings, AVE, and CR values have fulfilled the criteria, the measurement model showed that all items are valid and reliable indicators of constructs being hypothesized [66], [67].

4.2 Structural model

The structural model was conducted to test six hypotheses proposed in this study. According to [64], the hypotheses are supported if they have at least a p-value of 0.05, and the T-Statistic (t-value) should be greater than 1.96 for a significance level of 5%. Based on Table 4, the statistical result of every path in the research model indicated that most of the hypotheses were supported, except hypotheses (H6) effect of social influence (SI)

Table 3. Descriptive statistic and convergent validity

Construct	Item	Mean	Standard Deviation	Outer Loading	Deleted Item	AVE
Performance Expectancy (PE)	PE1	3.195	0.541	0.865	-	0.703
	PE2*	3.017	0.520	0.666		
	PE3	3.085	0.546	0.755		
Effort Expectancy (EE)	EE1	3.195	0.600	0.870	-	0.704
	EE2	3.203	0.497	0.766		
	EE3	3.169	0.557	0.878		
Social Influence (SI)	SI1	2.932	0.686	0.976	SI2 SI3	1.000
	SI2	2.263	0.706	0.211		
	SI3	2.222	0.655	0.223		
Facilitating Conditions (FC)	FC1	3.407	0.641	0.678	-	0.990
	FC2	3.068	0.621	0.619		
	FC3	3.068	0.563	0.842		
Doctor's Opinion (DO)	DO1	3.059	0.509	0.841	-	0.725
	DO2	3.169	0.457	0.546		
	DO3	3.042	0.543	0.812		
Computer Anxiety (CA)	CA1	3.034	0.430	-0.230	CA1 CA2	1.000
	CA2	3.008	0.422	0.459		
	CA3	2.941	0.418	0.892		
Behavioral Intention to Use (BI)	BI1	2.297	0.751	0.803	BI2	0.764
	BI2	2.949	0.534	0.460		
	BI3	3.042	0.543	0.915		

Discriminat Validity and Reliabilty

	BI	CA	DO	EE	FC	PE	SI	Composite Reliability
BI	**0.874**							0.866
CA	0.444	**1**						1.000
DO	0.368	0.433	**0.851**					0.840
EE	0.483	0.301	0.558	**0.839**				0.876
FC	0.467	0.295	0.25	0.257	**1**			1.000
PE	0.518	0.377	0.385	0.472	0.305	**0.839**		0.824
SI	0.401	0.235	0.242	0.355	0.319	0.402	**1**	1.000

Table 4. Hypotheses testing

Hypotheses	Path	Path Coefficient (β)	T-Statistic	P-Value	Result
H1	PE → BI	0.240	2.483	0.013	Supported**
H2	EE → BI	0.286	2.736	0.006	Supported**
H3	SI → BI	0.116	1.032	0.302	Not Supported
H4	FC → BI	0.271	2.572	0.010	Supported**
H5	CA →EE	0.321	2.051	0.041	Supported*
H6	DO → PE	0.385	2.945	0.003	Supported**
H7	DO → BI	0.258	4.051	0.000	Supported**
H8	CA → BI	0.221	2.889	0.000	Supported**
H9	DO → PE → BI	-	2.058	0.048	Supported*
H10	CA → EE → BI	-	2.113	0.035	Supported*

Significant at ** p < 0.01 (confidence interval 95%), Significant at *p<0.05

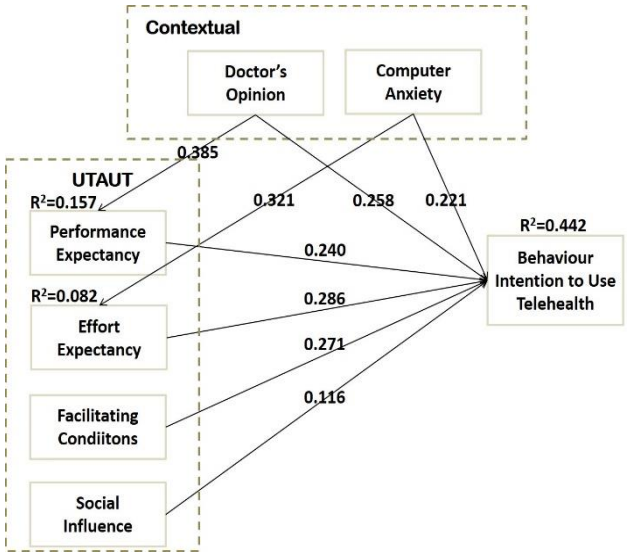

Figure. 2 Result of PLS analysis

on Behavioral Intention to use (BI) because its p-value obtained was 0.302 (> 0.05) and T-Statistic (t-value) was lower than 1.96. A summary of the hypotheses testing results of the standardized path coefficients and path significances is given in Table 4. Most of the paths are significant in the expected direction. Overall, 9 out of 10 hypotheses are supported in the conceptual framework.

Fig. 2 explains the R^2 and the patch coefficient of the proposed research model. The R^2 indicates the explanatory power of exogenous constructs on endogenous constructs. R^2 has a value range between 0 and 1, while a higher value means a higher predictive accuracy level. According to [68], the value of R^2 of the endogenous variable should be higher than 26% for indicating a good model. Behavioral intention to use (BI) is found to be significantly determined by three constructs, i.e., performance expectancy (PE), effort expectancy (EE), and facilitating conditions (FC), resulting in 43.6%, which is higher than the suggested value. This indicates a higher level of PE, EE, and FC will raise the BI. In other words, those constructs mentioned above can explain about 43.6% of the variance in BI. This implies that BI may be explained by other constructs out of this research. In addition, the variance of performance expectancy and effort expectancy could be explained by doctors' opinion (DO) 14.8% and computer anxiety (CA) 9.1%, respectively.

5. Discussion

This study examined the extended UTAUT model proposed to understand consumers' acceptance of Telehealth. Telehealth has become an emerging technology, especially since the covid-19 outbreak in Indonesia. The increased use of Telehealth is due to government policy with the implementation of social distancing, which prohibits people from doing activities outside the home and not gathering in crowds. The Covid-19 pandemic has made the trend of using healthcare applications increase significantly. It was proven that during the Covid-19 pandemic, one of the most popular Telehealth applications in Indonesia, such as Halodoc, increased in the number of users up to 20 million people per month on its platform [69]. This social behavior shows that health digitization innovation is needed. Research examining the factors that influence Telehealth is still limited; even in Indonesia, it has never been conducted. The approach presented in this study adds to the current literature by implementing an existing theoretical model and lets researchers and clinicians achieve a greater understanding of the actions of consumers of Telehealth. Thus, it is important to evaluate the factors influencing the acceptance of

Telehealth. The result of PLS analysis shows that 9 out of 10 hypotheses were supported in this study. While the previous study indicates that PE is the strongest predictor of behavioral acceptance [11, 28], the result of our analysis reveals that EE has a more critical role than PE. This indicates that Indonesian users are highly likely to have a stronger intention to use Telehealth if they perceive that the technology is simple and easy to use. Users feel usually connected to technology that is convenient since Telehealth is relatively new to the users. That is to say that, the more important thing for users during this pandemic is the ease of use of health information and services through Telehealth instead of having to come and queue at hospitals or other health facilities such as clinics which can pose a risk of contracting COVID-19. The community's awareness also drives this in complying with the government's prohibition of not leaving the house. EE was already regarded as a crucial factor directly affecting the decision of consumers to adopt Telehealth. Our results are similar to previous researches that EE has more of an influence than PE [27, 47, 55].

The role of FC was affirmed by respondents, such as technical support, to help users when experiencing system difficulties. The independent technical support will be an essential source of information needed to guide them when deciding to use the system. The finding is consistent with a variety of recent experiments in which encouraging factors have a substantial effect on the expected use of actions [11, 27, 28].

Surprisingly, SI has the weakest impact on behavioral intention to use and was not confirmed as a BI predictor in this study. The reports are contradictory with recent literature and run contrary to traditional and observational conclusions, such as those endorsed by the research [11, 16, 28]. However, previous researches show that the situational context of technology use could change the role of SI [70]. One possible explanation of the findings may be that the majority of the respondents in our study are early adopters who are considered reluctant to other people's opinions. Based on [71], early adopters consumers tend to be young but with higher education, like most of the respondents in our research (17-27 years old: 92%; bachelor's degree and above: 54%). Another explanation behind the result may be that the early adopters are likely to develop independent evaluations and may place less weight on others' opinions [39]. Our results were reflected in other studies where there was no effect of SI on the user's intention to use Telehealth technology [27, 44, 45, 55].

Our results reveal that DO has a positive and significant impact on PE, as expected in this study (H5). The results are in line with previous studies [27, 55] respectively, indicating the relationship between the physician and patient is asymmetrical where the doctor had significantly more information about medical care than their patient. According to [32], more than half of respondents chose physician opinions as to the most important type of information in their decision making to obtain medical interventions. Thus, this brings in the critical influence of the DO's role, where affirmation by a physician will influence the level at which Telehealth is perceived as useful and beneficial.

The role of CA was confirmed as an essential predictor of EE in this study. This results are also in line with previous studies [16, 18, 29, 30] where the CA has a significant influence on behavioral intention to use healthcare technologies. According to [31], CA has been integrated into the technology acceptance model and proven to be one of the predictors of behavioral intention to use healthcare technology through effort expectancy. Similarly, [16] reported that computer anxiety has a significant effect on effort expectancy.

Since Telehealth is an emerging technology, CA has become an important construct to be concerned with analyzing how users' embrace and adopt this new kind of technology. However, the result also shows that computer anxiety has a positive impact on effort expectancy in this study, contrasting with [45] that found the negative impact of computer anxiety on perceived ease of use. The possible explanation of this finding may be that most respondents are young educated people (17-27 years old and bachelor degree) that have already sufficient knowledge and skill in using computers.

The findings also confirm the significance of DO on the BI directly, and indirectly through PE to adopt Telehealth. These noteworthy relationships between constructs direct that higher doctor's opinion increase performance expectancy of Telehealth will lead to greater people's intention to use. Likewise, CA directly regulates BI and indirectly through EE to adopt Telehealth.

Finally, significant direct and indirect effect of doctor's opinion and computer anxiety on behavioral intention indicated that these two constructs yield more positive influence on adoption when integrated with others IT adoption models such as UTAUT.

6. Conclusions

This study demonstrates the urgency of doctor's opinion and computer anxiety as antecedent variables in developing the UTAUT concept in the healthcare sector. We conclude that digital communication aspects between end-users and physicians in Telehealth practice help implement the Telehealth concept more comprehensively; The support and opinion from doctors can influence the patients' decision-making who seek health services using Telehealth applications. Telehealth can help people get health services quickly and practically, especially in a pandemic like now. Dense activity certainly requires people to carry out activities dynamically. The decline in health conditions tend to be neglected because they are preoccupied with various routines every day. Telehealth can be a new solution and strategy for the world of Health to reach more dynamic and innovative health services.

Telehealth, with the support of a doctor's opinion, for example, on a chat service in an application, of course, makes it easier for patients to be able to consult anytime and anywhere about their complaints so that based on these opinions and suggestions, patients can make decisions as quickly as possible. Furthermore, the sophisticated technology applied to Telehealth application helps patients or end-users to be able to get second-opinions freely, openly, and flexibly from various doctors.

Theoretical Implication: The demonstrations we have done provide evidence that the application of the UTAUT concept combined with the antecedent variables we propose (e.g., doctor's opinion and computer anxiety) has been empirically proven to have a positive and significant impact in intervening UTAUT components in a healthcare perspective. This study positively contributes to scientific development, especially in the field of information systems. Implementing digital-based applications with the UTAUT concept approach should have fundamental/antecedent reasons. The implementation of a digital application can provide complicated and rational reasons for users to use Telehealth apps.

Managerial implications: Telehealth in the health service system can be a means and a new innovative strategy mainly to be applied during the Covid-19 pandemic, not only for hospitals, or other health service providers, the application of Telehealth can be enforced. Still, it can also be a means for start-up application developers. Another positive impact of using Telehealth is helping people get health services dynamically, efficiently, effectively, and flexibly. Furthermore, the findings suggest that health service providers should manage their users' performance expectancy, effort expectancy, facilitating conditions, doctors' opinion and computer anxiety to increase the intention to use Telehealth. In addition, health service providers can also categorize their customers based on latent variables we observed. The categorization can be used as an input for setting customers target for the provider.

Limitations and future research

Even though this research has reported interesting findings, there are several limitations. First, the study uses a convenience sampling technique for collecting the data, so it will be a concern to generalize the result. Besides, a cross-sectional study was applied so we could not capture an accurate view of users' perception over time. Second, the R2 of this research is 43.6%. It means there are still other antecendent variables of users' intention to use Telehealth.

Based on the limitations, this study recommends several future studies. First, future research is needed to apply a probability sampling technique. We also suggest using more samples that cover wider geographic regions to test the stability and generalization of these findings. Second, future research is required to include other variables in the research model.

Conflicts of interest

The authors declare no conflict of interest.

Author contributions

Conceptualization, Darmawan Napitupulu and Rudi Yacub; methodology, Darmawan Napitupulu and Aditya Halim Perdana Kusuma Putra; software, Darmawan Napitupulu; validation, Darmawan Napitupulu and Rudi Yacub; formal analysis, Darmawan Napitupulu and Aditya Halim Perdana Kusuma Putra; resources, Rudi Yacub; writing—original draft preparation, Darmawan Napitupulu and Rudi Yacub; writing—review and editing, Darmawan Napitupulu and Aditya Halim Perdana Kusuma Putra.

References

[1] A. C. Smith, "Telehealth for global emergencies: Implications for coronavirus disease 2019 (COVID-19)", *J. Telemed. Telecare*, Vol. 26, No. 5, pp. 309–313, 2020.

[2] "WHO Coronavirus Disease (COVID-19) Dashboard", https://covid19.who.int/ (Accessed: 17-Dec-2020).

[3] C. Sohrabi, Z. Alsafi, N. O'Neill, M. Khan, A.

Kerwan, A. Al-Jabir, C. Losifidis, and R. Agha, "World Health Organization declares global emergency: A review of the 2019 novel coronavirus (COVID-19)," *Int. J. Surg.*, 2020.

[4] A. A. Pradana, Casman, and Nur'aini, "The Effect of Social Distancing Policy on the Covid-19 Outbreak Against Vulnerable Groups in Indonesia", *J. Kebijak. Kesehat. Indones.*, Vol. 09, No. 02, pp. 61–67, 2020.

[5] "Coronavirus may never go away, World Health Organization warns", https://www.bbc.com/news/world-52643682. (Accessed: 17-Dec-2020).

[6] S. Doraiswamy, A. Abraham, R. Mamtani, and S. Cheema, "Use of Telehealth During the COVID-19 Pandemic: Scoping Review", *J. Med. Internet Res.*, Vol. 22, No. 12, p. e24087, 2020.

[7] A. Bhattacherjee and N. Hikmet, "Reconceptualizing organizational support and its effect on information technology usage: Evidence from the health care sector", *J. Comput. Inf. Syst.*, Vol. 48, No. 4, pp. 69–76, 2008.

[8] E. R. Dorsey, and E. J. Topol, "State of telehealth", *N. Engl. J. Med.*, Vol. 375, No. 2, pp. 154–161, 2016.

[9] D. Özdemir-Güngör, and H. Camgöz-Akdağ, "Examining the effects of technology anxiety and resistance to change on the acceptance of breast tumor registry system: Evidence from Turkey", *Technol. Soc.*, Vol. 54, No. January, pp. 66–73, 2018.

[10] J. M. Tsai, M. J. Cheng, H. H. Tsai, S. W. Hung, and Y. L. Chen, "Acceptance and resistance of telehealth: The perspective of dual-factor concepts in technology adoption", *Int. J. Inf. Manage.*, Vol. 49, No. March, pp. 34–44, 2019.

[11] B. Kijsanayotin, S. Pannarunothai, and S. M. Speedie, "Factors influencing health information technology adoption in Thailand's community health centers: Applying the UTAUT model", *Int. J. Med. Inform.*, Vol. 78, No. 6, pp. 404–416, 2009.

[12] V. Venkatesh, J. Y. L. Thong, and X. Xu, "Consumer acceptance and use of information technology: Extending the unified theory of acceptance and use of technology", *MIS Q. Manag. Inf. Syst.*, 2012.

[13] F. D. Davis, "Perceived usefulness, perceived ease of use, and user acceptance of information technology", *MIS Q. Manag. Inf. Syst.*, Vol. 13, No. 3, pp. 319–339, 1989.

[14] Y. K. Dwivedi, N. P. Rana, M. Janssen, B. Lal, M. D. Williams, and M. Clement, "An empirical validation of a unified model of electronic government adoption (UMEGA)", *Gov. Inf. Q.*, Vol. 34, No. 2, pp. 211–230, 2017.

[15] A. Bhattacherjee, and N. Hikmet, "Physicians' resistance toward healthcare information technology: A theoretical model and empirical test", *Eur. J. Inf. Syst.*, Vol. 16, No. 6, pp. 725–737, 2007.

[16] V. P. Aggelidis, and P. D. Chatzoglou, "Using a modified technology acceptance model in hospitals", *Int. J. Med. Inform.*, Vol. 78, No. 2, pp. 115–126, 2009.

[17] A. L. Kellermann, and S. S. Jones, "What it will take to achieve the as-yet-unfulfilled promises of health information technology", *Health Aff.*, Vol. 32, No. 1, pp. 63–68, 2013.

[18] C. Lin, I.-C. Lin, and J. Roan, "Barriers to physicians' adoption of healthcare information technology: an empirical study on multiple hospitals", *J. Med. Syst.*, Vol. 36, No. 3, pp. 1965–1977, 2012.

[19] Y. Zhao, Q. Ni, and R. Zhou, "What factors influence the mobile health service adoption? A meta-analysis and the moderating role of age", *Int. J. Inf. Manage.*, Vol. 43, pp. 342–350, 2018.

[20] "Countries where Coronavirus has spread", https://www.worldometers.info/coronavirus/countries-where-coronavirus-has-spread/. (Accessed: 07-Feb-2021).

[21] S. Sumaedi, I.G.M.Y. Bakti, T. Rakhmawati, N.J. Astrini, T. Widianti, S. Damayanti, M.A. Massijaya and R.K. Jati, "A model of intention to use official COVID-19 websites", *Health Educ.*, Vol. 120, No. 4, pp. 249–261, 2020.

[22] "About Telehealth", https://www.cchpca.org/about/about-telehealth. [Accessed: 19-Dec-2020].

[23] G. Novara, "Telehealth in Urology: A Systematic Review of the Literature. How Much Can Telemedicine Be Useful During and After the COVID-19 Pandemic?", *Eur. Urol.*, Vol. 78, No. 6, pp. 786–811, 2020.

[24] WHO, *A Health Telematics Policy*. 1998.

[25] A. K. Majumdar, "Advances in telemedicine and its usage in India", In: *Proc. of 15th International Conference on Advanced Computing and Communications (ADCOM)*, pp. 101–109, 2007.

[26] R. E. Scott, and M. Mars, "Telehealth in the developing world: current status and future prospects", *Smart Homecare Technol. TeleHealth*, Vol. 3, pp. 25–37, 2015.

[27] M. Cimperman, M. Makovec Brenčič, and P. Trkman, "Analyzing older users' home telehealth services acceptance behavior-

applying an Extended UTAUT model", *Int. J. Med. Inform.*, Vol. 90, pp. 22–31, 2016.
[28] M. Z. Alam, M. R. Hoque, W. Hu, and Z. Barua, "Factors influencing the adoption of mHealth services in a developing country: A patient-centric study", *Int. J. Inf. Manage.*, Vol. 50, No. May, pp. 128–143, 2020.
[29] K.-M. Kuo, C.-F. Liu, and C.-C. Ma, "An investigation of the effect of nurses' technology readiness on the acceptance of mobile electronic medical record systems", *BMC Med. Inform. Decis. Mak.*, Vol. 13, No. 1, p. 88, 2013.
[30] A. K. Yarbrough, and T. B. Smith, "Technology acceptance among physicians: a new take on TAM", *Med. Care Res. Rev.*, Vol. 64, No. 6, pp. 650–672, 2007.
[31] A. Sarlan, R. Ahmad, W. F. W. Ahmad, and P. D. D. Dominic, "Users' behavioral intention to use clinic information system: A survey", In: *Proc. of International Conference on Computer & Information Science (ICCIS)*, pp. 37–43, 2012.
[32] S. M. Akerkar, and L. S. Bichile, "Doctor patient relationship: changing dynamics in the information age", *J. Postgrad. Med.*, Vol. 50, No. 2, p. 120, 2004.
[33] D. J. Mazur, D. H. Hickam, M. D. M. Bs, and M. D. Mazur, "The role of doctor ' s opinion in shared decision making : what does shared decision making really mean when considering invasive medical procedures ?", *Heal. Expect.*, Vol. 8, pp. 97–102, 2005.
[34] S. G. S. Shah, J. Barnett, J. Kuljis, K. Hone, and R. Kaczmarski, "Factors determining patients' intentions to use point-of-care testing medical devices for self-monitoring: the case of international normalized ratio self-testing", *Patient Prefer. Adherence*, Vol. 7, pp. 1, 2013.
[35] M. Kurfalı, A. Arifoğlu, G. Tokdemir, and Y. Paçin, "Adoption of e-government services in Turkey", *Comput. Human Behav.*, Vol. 66, pp. 168–178, 2017.
[36] P. J. B. Tan, "Applying the UTAUT to understand factors affecting the use of english e-learning websites in Taiwan", *SAGE Open*, Vol. 3, No. 4, 2013.
[37] R. E. Bawack, and J. R. Kala Kamdjoug, "Adequacy of UTAUT in clinician adoption of health information systems in developing countries: The case of Cameroon", *Int. J. Med. Inform.*, Vol. 109, pp. 15–22, 2018.
[38] H. Wang, D. Tao, N. Yu, and X. Qu, "Understanding consumer acceptance of healthcare wearable devices: An integrated model of UTAUT and TTF", *Int. J. Med. Inform.*, Vol. 139, pp. 104156, 2020.
[39] V. Venkatesh, M. G. Morris, G. B. Davis, and F. D. Davis, "User Acceptance of Information Technology: Toward a Unified View", *MIS Q.*, Vol. 27, No. 3, pp. 425–478, 2003.
[40] P. J. Hu, P. Y. K. Chau, O. R. L. Sheng, and K. Y. Tam, "Examining the technology acceptance model using physician acceptance of telemedicine technology", *J. Manag. Inf. Syst.*, Vol. 16, No. 2, pp. 91–112, 1999.
[41] M. P. Gagnon, E. Orruno, J. Asua, A. Ben Abdeljelil, and J. Emparanza, "Using a modified technology acceptance model to evaluate healthcare professionals' adoption of a new telemonitoring system", *Telemed. e-Health*, Vol. 18, No. 1, pp. 54–59, 2012.
[42] Y. Sun, N. Wang, X. Guo, and Z. Peng, "Understanding the acceptance of mobile health services: a comparison and integration of alternative models", *J. Electron. Commer. Res.*, Vol. 14, No. 2, pp. 183, 2013.
[43] P. Ifinedo, "Applying uses and gratifications theory and social influence processes to understand students' pervasive adoption of social networking sites: Perspectives from the Americas", *Int. J. Inf. Manage.*, Vol. 36, No. 2, pp. 192–206, 2016.
[44] M.-P. Gagnon, "An adaptation of the theory of interpersonal behaviour to the study of telemedicine adoption by physicians", *Int. J. Med. Inform.*, Vol. 71, No. 2–3, pp. 103–115, 2003.
[45] P. Y. K. Chau, and P. J.-H. Hu, "Investigating healthcare professionals' decisions to accept telemedicine technology: an empirical test of competing theories", *Inf. Manag.*, Vol. 39, No. 4, pp. 297–311, 2002.
[46] W. Boontarig, W. Chutimaskul, V. Chongsuphajaisiddhi, and B. Papasratorn, "Factors influencing the Thai elderly intention to use smartphone for e-Health services", In: *Proc.of IEEE symposium on humanities, science and engineering research*, pp. 479–483 2012.
[47] M. Hoque, "Investigating factors influencing the adoption of e-Health in developing countries: A patient's perspective", *Informatics Heal. Soc. Care*, Vol. 42, No. 1, pp. 1–17, 2017.
[48] A. D. Smith, and D. R. Manna, "Exploring the trust factor in e-medicine", *Online Inf. Rev.*, 2004.
[49] P. Williams, D. Nicholas, and P. Huntington, "Health information on the Internet: a qualitative study of NHS Direct Online users", In: *Proc. of Aslib proceedings*, 2003.
[50] P. D. Chatzoglou, L. Sarigiannidis, E. Vraimaki,

and A. Diamantidis, "Investigating Greek employees' intention to use web-based training", *Comput. Educ.*, Vol. 53, No. 3, pp. 877–889, 2009.

[51] J. M. Muñoz-Rodríguez, F. Sánchez-Carracedo, A. Barrón-Ruiz, and S. Serrate-González, "Are we training in sustainability in higher education? Case study: Education degrees at the university of Salamanca", *Sustain.*, Vol. 12, No. 11, 2020.

[52] M. Hamlin, S. Steingrimsson, I. Cohen, V. Bero, A. Bar-Tl, and B. Adini, "Attitudes of the public to receiving medical care during emergencies through remote physician– patient communications", *Int. J. Environ. Res. Public Health*, Vol. 17, No. 14, pp. 1–12, 2020.

[53] N. Archer, and M. Cocosila, "Canadian patient perceptions of electronic personal health records: An empirical investigation", *Commun. Assoc. Inf. Syst.*, Vol. 34, No. 1, pp. 389–406, 2014.

[54] S. Hung, Y. Ku, and J. Chien, "Understanding physicians ' acceptance of the Medline system for practicing evidence-based medicine : A decomposed TPB model", *Int. J. Med. Inform.*, Vol. 81, No. 2, pp. 130–142, 2011.

[55] A. Zolait, N. Radhi, M. M. Alhowaishi, and L. M. Aldoseri, "Can Bahraini patients accept e-health systems ?", *Int. J. Healthc. Qual. Assur.*, Vol. 43, No. 4, pp. 720–730, 2019.

[56] J. Louissaint, A. S. Lok, B. E. Fortune, and E. B. Tapper, "Acceptance and use of a smartphone application in cirrhosis", *Liver Int.*, No. April, pp. 1556–1563, 2020.

[57] J. F. Hair, J. Henseler, T. K. Dijkstra, and M. Sarstedt, "Common beliefs and reality about partial least squares: comments on Rönkkö and Evermann", 2014.

[58] W. Chin, "The partial least squares approach to structural equation modeling", *Mod. methods Bus. Res.*, Vol. 295, No. 2, pp. 295–336, 1998.

[59] J. L. Krull, and D. P. MacKinnon, "Multilevel mediation modeling in group-based intervention studies", *Eval. Rev.*, Vol. 23, No. 4, pp. 418–444, 1999.

[60] J. F. Hair, J. J. Risher, M. Sarstedt, and C. M. Ringle, "When to use and how to report the results of PLS-SEM", *Eur. Bus. Rev.*, Vol. 31, No. 1, pp. 2–24, 2019.

[61] D. Goodhue, W. Lewis, and R. Thompson, "PLS, small sample size, and statistical power in MIS research", In: *Proc. of the 39th Annual Hawaii International Conference on System Sciences (HICSS'06)*, pp. 202b-202b, 2006.

[62] D. Peng, and F. Lai, "Using partial least squares in operations management research : A practical guideline and summary of past research &", *J. Oper. Manag.*, Vol. 30, No. 6, pp. 467–480, 2012.

[63] J. F. Hair Jr, M. Sarstedt, L. Hopkins, and V. G. Kuppelwieser, "Partial least squares structural equation modeling (PLS-SEM)", *Eur. Bus. Rev.*, 2014.

[64] J. F. Hair, C. M. Ringle, and M. Sarstedt, "Partial Least Squares Structural Equation Modeling: Rigorous Applications, Better Results and Higher Acceptance", *Long Range Plann.*, Vol. 46, No. 1–2, pp. 1–12, 2013.

[65] C. Fornell and D. F. Larcker, "Evaluating Structural Equation Models with Unobservable Variables and Measurement Error", *J. Mark. Res.*, Vol. 18, No. 1, p. 39, 1981.

[66] R. Hamdollah, and P. Baghaei, "Partial least squares structural equation modeling with R", *Pract. Assessment, Res. Eval.*, Vol. 21, No. 1, pp. 1–16, 2016.

[67] B. Wu, and X. Chen, "Continuance intention to use MOOCs: Integrating the technology acceptance model (TAM) and task technology fit (TTF) model", *Comput. Human Behav.*, Vol. 67, pp. 221–232, 2017.

[68] J. Cohen, P. Cohen, S. G. West, and L. S. Aiken, *Applied multiple regression/correlation analysis for the behavioral sciences*. Routledge, 2013.

[69] "Pengguna Aplikasi Kesehatan Meningkat Saat Pandemi, Halodoc Dipakai 20 Juta Orang per Bulan," https://nextren.grid.id/read/012415846/pengguna-aplikasi-kesehatan-meningkat-saat-pandemi-halodoc-dipakai-20-juta-orang-per-bulan?page=2 (Accessed: 11-Nov-2020).

[70] W. Lewis, R. Agarwal, and V. Sambamurthy, "Sources of Influence on Beliefs about Information Technology Use: An Empirical Study of Knowledge Workers", *MIS Quart.*, Vol. 27, No. 4, pp. 657–678, 2003.

[71] D. Läpple, and T. Van Rensburg, "Adoption of organic farming: Are there differences between early and late adoption?," *Ecol. Econ.*, Vol. 70, No. 7, pp. 1406–1414, 2011.