International Journal of Computing Sciences Research (ISSN print: 2546-0552; ISSN online: 2546-115X)
Vol. 7, pp. 1362-1384
doi: 10.25147/ijcsr.2017.001.1.107
https://stepacademic.net

Long Paper

Applying the TPB and the UTAUT Models Predicting Intentions to Use Telemedicine Among Thai People During the COVID-19 Pandemic

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Date received: May 9, 2022
Date received in revised form: June 17, 2022
Date accepted: June 20, 2022

Recommended citation:

Siripipatthanakul, S., Limna, P., Sriboonruang, P., & Kaewpuang, P. (2023). Applying the TPB and the UTAUT models predicting intentions to use telemedicine among Thai people during the COVID-19 pandemic. *International Journal of Computing Sciences Research, 7*, 1362-1384. https://doi.org/10.25147/ijcsr.2017.001.1.107

Abstract

Purpose – This study applied the theory of planned behaviour (TPB) model and the unified theory of acceptance and use of technology (UTAUT) model to predict intentions to use telemedicine among Thai people during the COVID-19 pandemic.

Method – The TPB model predictors of intentions to use telemedicine included attitude, subjective norm, and perceived behavioural control. The UTAUT predictors of intentions to use telemedicine included performance expectancy, effort expectancy, and facilitating conditions. The data were gathered using convenience sampling among 213 respondents collected through self-administered online questionnaires. The conceptual framework was examined with the Partial Least Squares Structural Equation Modelling (PLS-SEM), adopting the ADANCO software program (version 2.3) and SPSS (version 27).

Results – The empirical findings showed the relationship between predictors and intentions to use telemedicine during the COVID-19 pandemic among Thai people. The results revealed that performance expectancy strongly influences attitude, followed by subjective norm and perceived behavioural control. But attitude is not a significant mediator between antecedents of effort expectancy, subjective norm, perceived behavioural control and intentions to use telemedicine. Moreover, performance expectancy has the most influence on intentions to use telemedicine, followed by facilitating conditions and effort expectancy.

Conclusion – The healthcare strategic planners should pay attention to performance expectancy, facilitating conditions and effort expectancy because these factors impact intentions to use telemedicine among Thai people.

Recommendations –The recommendation is to consider a qualitative study in further study for more insight results to explain the relationship phenomenon among UTAUT, TPB model, and intentions to use telemedicine.

Implication – The implication benefits other sectors that could apply the UTAUT model to enhance the behavioural intention of customers and citizens.

Keywords – UTAUT, TPB, intention to use, telemedicine, COVID-19 pandemic

INTRODUCTION

In this era, technology has become increasingly important in people's lives. Moreover, social media, such as Facebook and LINE applications, plays a vital role as they allow users to send personal information, documents, videos, and photos electronically (Brem et al., 2021; Limna et al., 2021). The digital revolution has dramatically increased digital health information systems (Khan et al., 2019). With the outbreak of COVID-19, the

digital health information system has piqued the interest of both practitioners and academics (Chattu et al., 2021). Telemedicine, also known as telehealth technology, provides health care and exchanges health-related data across geographical boundaries (Limna et al., 2022a). Users or patients can consult on health issues from any location by using digital health technology. Moreover, telemedicine effectively reduces face-to-face consultations and, as a result, the risk of viral exposure. Hence, telemedicine is critical because it enables healthcare providers to provide safe, timely, and high-quality ambulatory care to their patients (Dingler et al., 2021; Dosaj et al., 2021).

Behaviour related to interest in using a product or service can be predicted through attitudes, subjective norms, and perceived behavioural control, as stated in the theory of planned behaviour (TPB) model (Gunawan et al., 2022). In addition, the unified theory of acceptance and use of technology (UTAUT), an individual acceptance model, has four key dimensions: performance expectancy, effort expectancy, social influence, and facilitating conditions. The UTAUT model aims to integrate disparate concepts and research on personal acceptance of information technology into a unified theoretical model that accounts for dynamic influences such as gender, age, voluntariness, and experience (Limna et al., 2022b). TPB is an important theory of rational consumption that has recently emerged in marketing. People will engage in certain behaviours under the following three conditions, according to this theory: (1) believe that the implementation of such behaviours will produce valuable results; (2) believe that others will approve of the behaviour and add value to it; and (3) believe that they have the necessary resources, skills, and opportunities to ensure behaviour's successful implementation.

Venkatesh et al. (2003) reviewed TAM-related studies over the years, the Unified Theory of Acceptance and Use of Technology (UTAUT) was proposed as the so-called "authoritative mode" to investigate the problem of influencing factors of users' cognition. Performance Expectancy (PE), one of the four core dimensions of UTAUT, refers to the extent to which individuals feel that using the system contributes to their work; Effort Expectancy (EE) refers to the amount of effort required for an individual to use a system; and Social Influence (SI) refers to the extent to which individuals feel influenced by surrounding groups, including Subjective norms, social factors, and public Image. Facilitating Conditions (FC) is the extent to which an individual perceives the organization's support for the use of relevant technology or equipment by the system (Venkatesh et al., 2003).

Hence, the TPB and the UTAUT models are crucial to study as they can be used to investigate individuals' intentions to use telemedicine during the COVID-19 pandemic. Consequently, this study extended the TPB and UTAUT models to predict intentions to use telemedicine among Thai people during the COVID-19 pandemic. The TPB model predictors of intentions to use telemedicine included attitude, subjective norm, and perceived behavioural control. The UTAUT predictors of intentions to use telemedicine included performance expectancy, effort expectancy, and facilitating conditions. This study may aid healthcare providers and online medical website developers with a clearer understanding

of users' behaviours and propose measures to improve service level and efficiency. As a result, people are more inclined to use telemedicine during the COVID-19 pandemic. Thus, this study provides a better describe the relationship between the TPB model and the UTAUT model in explaining the intentions to use telemedicine among Thai people during the COVID-19 pandemic.

Research Objective

This study investigates the relationship between the TPB model, the UTAUT model and intentions to use telemedicine among Thai people during the COVID-19 pandemic.

Research Question

How is the PLS Model explaining the relationships between the TPB model, the UTAUT model, and intentions to use telemedicine among Thai people during the COVID-19 pandemic in Thailand?

LITERATURE REVIEW

The COVID-19 Pandemic in Thailand

The COVID-19 pandemic has significantly impacted people's lives, regardless of their social demographics (Wungrath et al., 2021, a). On March 20th, 2022, 188 new cases of COVID-19 infection were reported, representing the most significant single-day increase since the outbreak reached Thailand. Enhanced control measures, such as screening at airports, isolation of infectious travellers, contact tracing, and self-quarantine, were imposed to combat the rapid spread of COVID-19. Thai nationals returning to the country were required to present a medical certificate stating there was no risk of COVID-19 infection. Personal and community hygiene, including frequent hand washing, the use of alcohol-based hand sanitisers, the wearing of face masks in public areas, respiratory etiquette, maintaining a physical distance of one to two meters, and temperature detection before entering sites, were requested (Srichannil, 2020).

Administrators and policymakers can effectively change people's behaviours by identifying high-leverage points for effective interventions and communicating broad actions across the various sectors whose support is required to control the epidemic. In the early days of the pandemic, when neither empirical data nor complex epidemiological modelling could rapidly inform decision-making, the adverse effects of COVID-19 in Thailand and other nations could have been predicted by employing fundamental principles of systems thinking and implementation science (Leerapan et al., 2022). Furthermore, the COVID-19 pandemic response demands quickly outpaced global resources. Thailand's authorities urged that successful application of technology implementation result in people taking more control of their health and in medical and

public health personnel improving efficiency to reduce the demand on health resources to meet people's health needs (Intawong et al., 2021).

The Theory of Planned Behaviour Model

Several general behaviour theories have been developed to explain how people engage in specific behaviours by identifying the antecedents of behavioural outcomes. One of the most well-known approaches to studying health behaviours is the theory of planned behaviour (TPB). It is widely used to forecast various health behaviours (Jandawapee et al., 2022). Three variables of the TPB model include attitude, subjective norm, and perceived behavioural control (Husain et al., 2021). Attitude refers to a person's positive (favourable) or negative (unfavourable) evaluations of those who express the behaviour. In contrast, subjective norm refers to the individual's perception of social pressure when expressing a certain mannerism. Additionally, the expressed behaviour of a person is heavily reliant on their voluntary control. It refers to the individual's ability to demonstrate how deeply people are willing to immerse themselves while performing the behaviour under the control of power within their beliefs (Aziz et al., 2021).

The TPB model's attitudes, subjective norms, and perceived behavioural control can predict people's intentions to get COVID-19 vaccines in Northern India (Husain et al., 2021). Moreover, the intention to follow the preventive COVID-19 protocols among Thai people can be predicted by attitudes, subjective norms, and perceived behavioural control of the TPB model (Jandawapee et al., 2022). The TPB model in this study comprises attitude, perceived behavioural control and subjective norm and relates to intentions to use telemedicine. The attitude refers to a person’s positive or negative evaluations of telemedicine. Subjective norm refers to social pressure on telemedicine usage. Perceive behavioural control in this study refers to an individual’s ability to perform the intention to use telemedicine.

The Unified Theory of Acceptance and Use of Technology Model

The unified theory of acceptance and use of technology (UTAUT) is a critical model for studying an individual's behavioural intention. Moreover, the UTAUT is a definitive model that synthesises what is known and serves as a foundation for future research in various fields, including education, business, and healthcare (Limna et al., 2022b). The UTAUT model's key dimensions include performance expectancy, effort expectancy, social influence, and facilitating conditions (Puriwat & Tripopsakul, 2021). Performance expectancy is the level at which technology will benefit individuals when performing an activity. The level of comfort associated with using technology by individuals is called effort expectancy. The level at which a person perceives those others vital to them, such as family and friends, believe that they should use certain technologies is referred to as social influence.

The perception of the availability of support and resources to carry out behaviour is referred to as the facilitating conditions. Conditions that facilitate the adoption of a technology or system have a relationship and a positive and significant effect on behaviour intention and actual use behaviour (Kurniawan et al., 2021). Effort expectation is a person's belief that using a particular technology will be effortless or relatively effortless (Venkatesh et al., 2003; Meyer-Waarden & Cloarec, 2022). Performance expectancy, effort expectancy, and social influence have a positive and impactful effect on Thai people's intention to use social media for business purposes. Facilitating conditions have a significant and positive impact on user behaviour (Puriwat & Tripopsakul, 2021). Furthermore, performance expectancy, effort expectancy, social influence and facilitating conditions of The UTAUT model can predict English learning intention via Netflix (English subtitle) among Thai people (Limna et al., 2022b).

The key dimensions of the UTAUT model in this study are performance expectancy, effort expectation, social influence, and facilitating conditions. Performance expectancy refers to the level at which telemedicine technology will benefit individuals. Effort expectation is a person's belief that using telemedicine technology will be effortless or relatively effortless. Facilitating conditions refer to the perception of the availability of support and resources to carry out intentions to use telemedicine.

Telemedicine

Telemedicine and telehealth are interchangeable to describe the use of medical information shared from one location to another via electronic communication to improve a patient's health (Wungrath et al., 2021, b). Telemedicine, or technology that supports and encourages long-distance clinical treatment, education, and health management, has grown in popularity over the last decade (Huang et al., 2019). Common modalities include mobile health apps, text, email, live video teleconferencing, store-and-forward technologies, remote patient monitoring, and mobile health apps. The frequency and severity of disasters or incidents that cause damage, ecological disruption, loss of human life, or degradation of health and health services and necessitate a response from outside the afflicted community have increased significantly in recent years (Lurie & Carr, 2018; Wungrath et al., 2021, b). Telemedicine is a combination of medical practice and information and communication technology. It is very effective for remote health care, particularly in areas where health facilities are difficult to obtain. However, the implementation of these technologies is frequently hampered by various issues (Nittari et al., 2020). Therefore, telemedicine and telehealth are interchangeable terms for the use of electronic communication to share medical information from one location to another to improve a patient's health. Telemedicine is a critical topic to study.

Intentions to Use Telemedicine

The COVID-19 pandemic is rapidly transforming the healthcare system, with telehealth and social media as key drivers of change (Wungrath et al., 2021, a). In addition, telemedicine, a twenty-first-century patient-centred strategy, may become necessary for healthcare providers and patients, especially during the COVID-19 pandemic, allowing patients to seek actual counselling on their health problems through discussion with a health care provider for the elderly. Hence, several factors can influence an individual's intention to use telemedicine (Narvaez et al., 2022; Chen & Liu, 2022). Telemedicine readiness, which includes technological readiness, motivational readiness, acceptance and use readiness, organisational readiness, information technology (IT) skills and learning readiness, engagement readiness, and societal readiness, is critical in influencing an individual's intention to use telemedicine. The level of telemedicine readiness is related to personal factors such as demographics, mode cognition, service willingness, and service experience, as well as organisational factors such as policy direction and human resources allocation (Yu-Tong et al., 2022).

Furthermore, individuals' intentions to use telemedicine are influenced by attitudes toward using technology, perceived usefulness, and ease of use (Anderson et al., 2022; Andriani & Berlianto, 2022). Value propositions, such as promoting telemedicine (word of mouth) as a hybrid service model that improves consumer-centred care, can also influence individuals' intentions to use telemedicine (Putra & Dewa Ayu, 2021; Thomas et al., 2022). Hence, it is critical to explore individuals' intentions to use telemedicine, as this could help healthcare sectors understand users' behaviours and advocate measures to enhance service level and efficiency. The behavioural intention in this study is the intention to use telemedicine in the future regarding the TPB and UTAUT model.

Hypotheses Development

The Relationship Between Subjective Norm, Perceived Behavioural Control, and an Individual's Attitude

Using the example of "Mobile Banking Adoption: An Examination of the Theory of Planned Behavior" as an example, to increase the understanding of mobile banking adoption by integrating the Technology Acceptance Model (TAM) and the Theory of Planned Behavior (TPB). Analysis of survey responses from 119 respondents' significant findings that partially support hypotheses. The results indicated that attitude toward mobile banking and the subjective norm has a significant positive effect on mobile banking adoption. Surprisingly, behavioural control and usefulness had no impact on the adoption of mobile banking. In addition, the regression results revealed that perceived usefulness has a significant impact on attitudes toward mobile banking, whereas the effect of perceived ease of use on attitudes toward mobile banking is not supported (Aboelmaged, & Gebba, 2013).

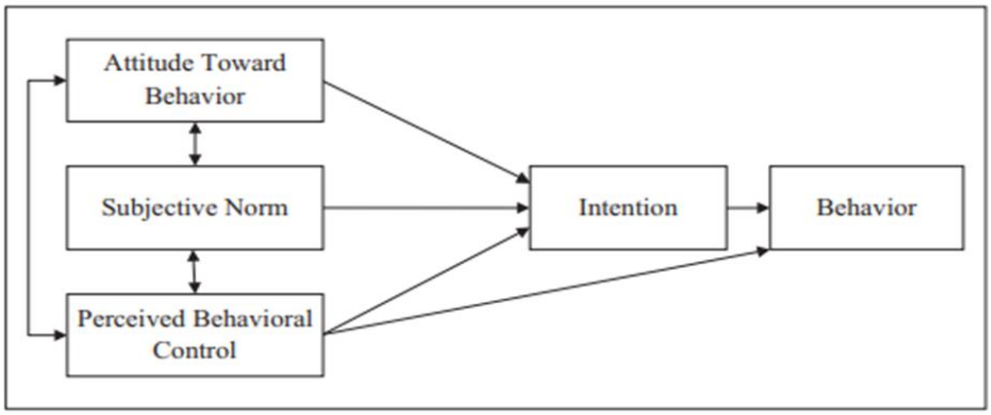

Figure 1. The Relationship Between Subjective Norm, Perceived Behavioural Control and Individuals' Behavioural Intentions (Ajzen, 1991; Tan, 2013)

Ajzen (1991) and Tan (2013) in Figure 1, show the TPB model. The theoretical framework demonstrates a connection between subjective norms and an individual's attitude. Additionally, perceived behavioural control is associated with an individual's attitude. The connection between a person's attitude, subjective norm, and perceived behavioural control. The theoretical framework in the relationship between subjective norm perceived behavioural control and an individual's attitude is hypothesised as follows.

- *H1: Subjective norm significantly influences an individual's attitude toward telemedicine usage during the COVID-19 pandemic.*

- *H2: Perceived behavioural control significantly affects an individual's attitude toward telemedicine usage during the COVID-19 pandemic.*

The Relationship Between Performance Expectancy, Individual Attitude and Behavioural Intention

Performance expectancy positively impacted schoolteachers' behavioural intentions to adopt online teaching during the COVID-19 pandemic (Tandon, 2021). Furthermore, performance expectancy significantly influenced the behavioural intention to use food delivery applications during the COVID-19 pandemic (Muangmee et al., 2021). Performance expectancy significantly influenced green product purchase intention (Sudirman et al., 2022). An individual's intention to donate via social media was significantly influenced by performance expectancy (Kurniawati et al., 2021). Performance expectations determine behavioural intention, and behavioural intention influences the use of social networking apps (Chua et al., 2018). Their attitudes influence customers' intentions to utilise Internet banking (Bashir & Madhavaiah, 2015). Thus, it is hypothesised as follows.

- *H3: Performance expectancy significantly impacts an individual's attitude toward telemedicine during the COVID-19 pandemic.*

- *H4: Performance expectancy significantly impacts an individual's intention to use telemedicine during the COVID-19 pandemic.*

The Relationship Between Effort Expectancy and an Individual's Behavioural Intention

Effort expectancy significantly influenced behavioural intention such as behaviour prospects to implement social media for business purposes (Puriwat & Tripopsakul, 2021). Moreover, effort expectancy significantly influenced behavioural intention such as green product purchase intention (Sudirman et al., 2022). Effort expectancy also significantly influenced an individual's intention to donate via social media (Kurniawati et al., 2021). Effort expectancy greatly affected behavioural intention to use digital banking (Musyaffi et al., 2021). There is a significant positive relationship between effort expectancy and the intention of Qatari citizens to use e-government services (Shafi, & Weerakkody, 2009). Additionally, there were important positive relationships between effort expectancy and behavioural intention to use (Moya et al., 2018). Therefore, behavioural intention to use telemedicine relates to effort expectancy and it is hypothesised as follows.

- *H5: Effort expectancy impacts an individual's intention to use telemedicine during the COVID-19 pandemic.*

The Relationship Between Facilitating Conditions and an Individual's Behavioural Intention

Facilitating conditions significantly and positively influenced user behaviour in using social media for business purposes (Puriwat & Tripopsakul, 2021). An individual's intention to donate via social media was significantly influenced by facilitating conditions (Kurniawati et al., 2021). Facilitating conditions also positively impacted teachers' behavioural intentions to adopt online teaching during the COVID-19 pandemic (Tandon, 2021). This highlights the need for organisations to foster a learning culture. So that the adoption of technology becomes an integral part of their day-to-day operations, humanitarian organisations may direct their efforts toward enhancing education, skills, and other resources, such as IT, and data mining instruction and facilitating conditions (Kabra et al., 2017). Thus, an individual's intention to use telemedicine relates to facilitating conditions and it is hypothesised as follows.

- *H6: Facilitating conditions influences an individual's intention to use telemedicine during the COVID-19 pandemic.*

The Relationship Between an Individual's Attitude and Behavioural Intention

Attitude significantly influenced the behavioural intention of university students in Indonesia to use eLearning during the COVID-19 pandemic (Mailizar et al., 2021). Furthermore, there was a positive relationship between attitude and an individual's intention to adopt big data analytics technologies in disaster management in Pakistan (Zaman et al., 2021). Attitude significantly influenced individuals' intentions to get COVID-19 vaccines in Northern India (Husain et al., 2021) and individuals' intentions to follow the preventive COVID-19 protocols in Thailand (Jandawapee et al., 2022). There are significant and positive relationships between the predictor variables attitude and subjective norm and the criterion variable of behavioural intention to use banking services (Alqasa et al., 2014). Thus, an individual's attitude relates to an individual's intention to use telemedicine and it is hypothesised as follows.

- *H7: Attitude significantly influences an individual's intention to use telemedicine during the COVID-19 pandemic.*

The Mediating Effect of Attitude Between Subjective Norm, Perceived Behavioural Control, Effort Expectancy and Behavioural Intention

The attitude was a significant mediator in the relationship between subjective norms and intention to adopt Islamic banking. Furthermore, religiosity and intention to use Islamic banking were significantly mediated by attitude (Bananuka et al., 2020). Moreover, the attitude was a significant mediator between performance expectancy, effort expectancy, compatibility, and an individual's intention to adopt big data analytics technologies in disaster management in Pakistan (Zaman et al., 2021). The attitude was also a significant mediator between affective risk perception and behavioural intention toward intact tourism during the first wave of the COVID-19 pandemic in South Korea (Bae & Chang, 2021). Therefore, attitude is the significant mediator between subjective norm, perceived behavioural control, performance expectancy and an individual's intention to use telemedicine during the COVID-19 pandemic.

- *H8: Attitude is a significant mediator between subjective norm, perceived behavioural control, performance expectancy and an individual's intention to use telemedicine during the COVID-19 pandemic.*

Conceptual Framework

The conceptual framework of this study in the relationships between the TPB and UTAUT model explaining intentions to use telemedicine is shown in Figure 2 as follows.

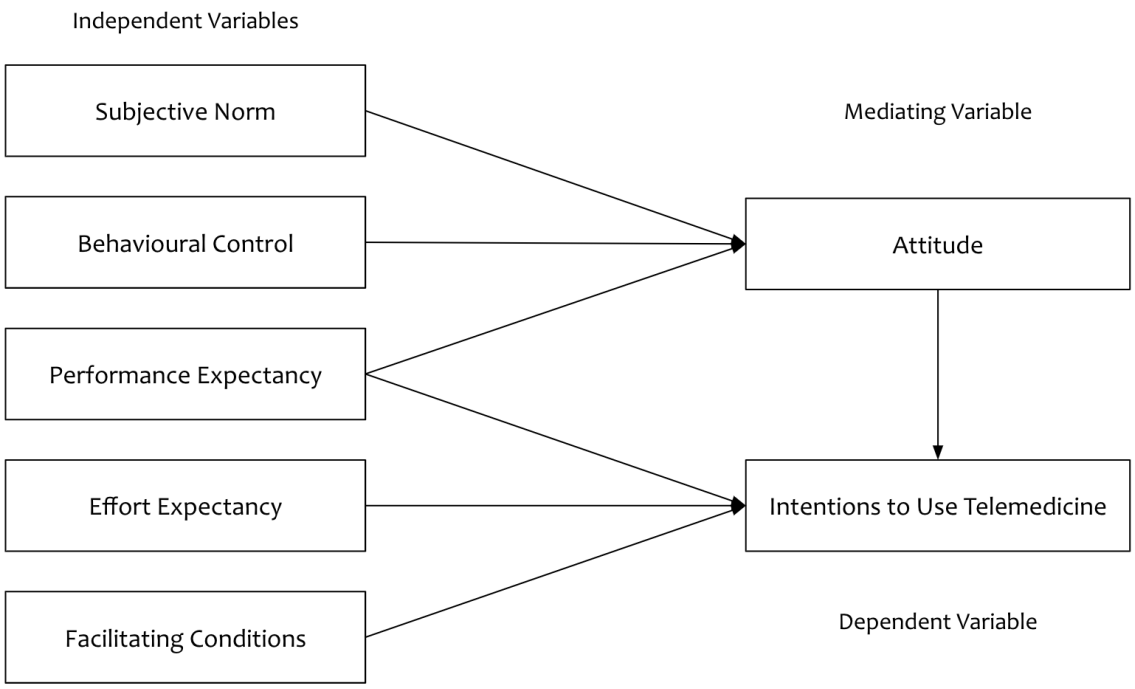

Figure 2. Conceptual Framework of this study

Figure 2 shows the conceptual model of this study that was based on the study of Limna et al. (2021) and Sitthipon et al. (2022).

METHODOLOGY

This quantitative study collected the data using online closed-ended questionnaires (Likert's Rating Scale). The questionnaire questions were developed based on reliable and valid research data. The validity of the measurement instruments was evaluated. Validity refers to the accuracy with which a measurement quantifies the researcher's concept (Zikmund, 2003). The study variables were measured using a five-point Likert Scale ranging from 1 (strongly disagree) to 5 (strongly agree). Questions about respondents' demographics were derived from the study of Jandawapee et al. (2022) and Sitthipon et al. (2022). The questionnaire items of the UTAUT model were based on a previous questionnaire derived by Yu (2012), and the TPB model and intentions to use telemedicine measurements were based on Aboelmaged & Gebba (2013). Three academic experts in business, healthcare and education proved the measurements.

Study Population and Sample

Unknown was the target population of the study. The researchers conducted a conventional survey with a confidence level of 95 per cent. A minimum of 100 cases with a p-value of 0.5 should be obtained through convenience sampling (Taherdoost, 2016). The

study included 213 participants in total who were from Thailand's five distinct geographical regions (Northern, Eastern, Central, Southern and Northeastern) in the data collection.

Data Collection

According to Napawut et al. (2022), a self-administered questionnaire was the instrument for collecting data. The researchers employed online self-administered questionnaires and were recruited through convenience sampling. Before distributing online questionnaires, it was essential to inform respondents of the study's objectives and solicit their participation. The data were collected between April 25th, 2022, and May 17th, 2022.

Data Analysis

The collected data were analysed with the SPSS (version 27) and ADANCO (Partial Least Squares Structural Equation Modelling) programs (version 2.3). The researchers contributed descriptive statistics regarding the demographic characteristics of the respondents and calculated the mean and standard deviation for each variable and questionnaire item. The data's validity and reliability were determined using reliability tests and factor loadings. According to the study by Siripipatthanakul, (2021), Kaewnaknaew et al. (2022), Si Dah et al. (2022), and Limsangpetch et al. (2022), the factor loading was set at 0.7, Cronbach's Alphas was set at 0.7, AVE was set at 0.5 and SRMR was set at 0.08.

RESULTS

Two hundred and twelve (213) participants completed online questionnaires. The findings revealed that most respondents were male (51.6%), the aged 26-35 years old (62.5%), single (82.2%), held a bachelor's degree (60.6%), employees (42.3%), and earned a monthly income between 10,001 and 30,000 baht (55.9%). Therefore, the demographic profile of the study's sample was representative of the telemedicine users.

According to the Table 1, Cronbach's Alphas are between 0.845 and 0.941 (over 0.7). AVEs are between 0.683 and 0.895 (over 0.5). Factors Loadings are between 0.759 and 0.953 (over 0.7). The means are between 4.54 and 4.80 (the interpretations are strongly agreed). The standard deviations are between 0.484 and 0.832 (less than 1). All values are acceptable.

Table 1. Item Loadings, Cronbach's Alpha, and Average Variance Extracted (n=213)

Items	Factor Loadings	Mean	SD.
Attitude			
Cronbach's Alpha = 0.845, AVE = 0.683			
ATT1: Using telemedicine saves my time in health consultations.	0.858	4.80	0.484
ATT2: Using telemedicine is secure in privacy and information.	0.759	4.56	0.766
ATT3: Using telemedicine will save me money.	0.836	4.66	0.606
ATT4: Using telemedicine will be good for me.	0.850	4.77	0.503
Subjective Norm			
Cronbach's Alpha = 0.865, AVE = 0.789			
SN1: My family and friends think I can use telemedicine during the COVID-19 pandemic.	0.836	4.71	0.532
SN2: My family and friends think I should use telemedicine during the COVID-19 pandemic.	0.909	4.65	0.645
SN3: My family and friends think I must use telemedicine during the COVID-19 pandemic.	0.917	4.54	0.832
Perceived Behavioral Control			
Cronbach's Alpha = 0.873, AVE = 0.798			
BC1: I can use telemedicine without help.	0.894	4.76	0.563
BC2: Using telemedicine would be entirely within my control.	0.881	4.67	0.698
BC3: I have the devices and knowledge to use telemedicine.	0.905	4.74	0.563
Performance Expectancy			
Cronbach's Alpha = 0.911, AVE = 0.790			
PE1: Using telemedicine would improve my performance in health consultations during the COVID-19 pandemic.	0.871	4.63	0.650
PE2. Using telemedicine would save my time in healthcare consultations during the COVID-19 pandemic.	0.907	4.77	0.540
PE3: I would use telemedicine anyplace through devices.	0.892	4.72	0.609
PE4: Telemedicine is useful for me.	0.884	4.78	0.486
Effort Expectancy			
Cronbach's Alpha = 0.941, AVE = 0.895			
EE1: Learning to use telemedicine is easy for me.	0.932	4.75	0.542
EE2: It is easy for me to develop telemedicine skills usage.	0.953	4.77	0.522
EE3: Interaction with telemedicine is easy for me.	0.953	4.79	0.500

Table 1. Item Loadings, Cronbach's Alpha, and Average Variance Extracted (n=213) (cont.)

Items	Factor Loadings	Mean	SD.
Facilitating Condition			
Cronbach's Alpha = 0.891, AVE = 0.822			
FC1: My living environment supports me to use telemedicine.	0.918	4.73	0.582
FC2: My working environment supports me in using telemedicine.	0.930	4.71	0.622
FC3: I can get help if I have problems using telemedicine.	0.870	4.69	0.622
Intention to Use Telemedicine			
Cronbach's Alpha = 0.923, AVE = 0.867			
IU1: I will use telemedicine if I need my health consultations during the COVID-19 pandemic.	0.927	4.75	0.540
IU2: I intend to use telemedicine in the future.	0.935	4.72	0.603
IU3: I will use telemedicine after the COVID-19 pandemic.	0.931	4.71	0.605

Table 2. R-Squared (n=213)

Construct	Coefficient of Determination (R^2)	Adjusted R^2
Attitude	0.8124	0.8097
Intentions to Use Telemedicine	0.8516	0.8488

According to Table 2, the coefficient of determination (R^2) to predict attitude equals 0.8124 or can be explained by predictors of about 81.24%. The coefficient of determination (R^2) to predict intentions to use telemedicine equals 0.8516 or can be explained by predictors of about 85.16%. The adjusted R-square to explain attitude and intentions to use telemedicine equals 0.8097 and 0.8488, respectively.

According to Table 3, the effect overview is including effects, Beta, indirect effect, total effect and Cohen's f^2. The high beta values mean higher predictive power. The indirect effects are not explained well because the betas are very low and range between only 0.0059 and 0.0204. Cohen's f^2 are between 0.0030 and 0.2908.

Table 3. Effect Overview (n=213)

Effect	Beta	Indirect Effect	Total Effect	Cohen's f^2
SN → IU		0.0172	0.0172	
SN → ATT	0.3846		0.3846	0.2908
BC → IU		0.0059	0.0059	
BC → ATT	0.1318		0.1318	0.0320
PE → IU	0.4535	0.0204	0.4739	0.2064
PE → ATT	0.4547		0.4547	0.2419
EE → IU	0.1711		0.1711	0.0490
FC → IU	0.3024		0.3024	0.1306
ATT → IU	0.0448		0.0448	0.0030

Table 4. Total Effects Inference (n=213)

Effect	Original Coefficient	Standard Bootstrap Results					Percentile Bootstrap Quartiles		
		Mean Value	Standard Error	T-Value	P-Value (2-Sided)	P-Value (1-Sided)	0.5%	2.5%	97.5%
SN → IU	0.0172	0.0238	0.0504	0.3420	0.7324	0.3662	-0.1132	-0.0685	0.1288
SN → ATT	0.3846	0.3839	0.0683	5.6266	0.0000	0.0000	0.2050	0.2535	0.5234
BC → IU	0.0059	0.0106	0.0214	0.2760	0.7826	0.3913	-0.0421	-0.0255	0.0637
BC → ATT	0.1318	0.1402	0.0777	1.6961	0.0902	0.0451	-0.0371	-0.0047	0.2972
PE → IU	0.4739	0.4771	0.0851	5.5681	0.0000	0.0000	0.2446	0.3034	0.6483
PE → ATT	0.4547	0.4491	0.0904	5.0313	0.0000	0.0000	0.2192	0.2666	0.6320
EE → IU	0.1711	0.1659	0.0713	2.4016	0.0165	0.0083	-0.0424	0.0180	0.3048
FC → IU	0.3024	0.2944	0.1005	3.0100	0.0027	0.0013	-0.0162	0.0856	0.4828
ATT → IU	0.0448	0.0652	0.1323	0.3391	0.7346	0.3673	-0.2522	-0.1821	0.3325

ATT = Attitude, SN = Subjective Norm, BC = Perceived Behavioural Control, PE = Performance Expectancy, EE = Effort Expectancy, FC = Facilitating Conditions, IU = Intention to Use Telemedicine

The total effect influence is shown in Table 4. The relationship between factors and outcomes is shown in the effects. The higher original coefficients mean the higher predictor powers. The standard bootstrap results comprise mean, standard error, T-value, p-value (2-tailed) and p-value (1-tailed). The percentile Bootstrap Quartiles comprise 0.5%, 2.5% and 97.5%, respectively. The significance level of 95% is accepted at a p-value less than 0.05. The significance level of 99% is accepted at a p-value less than 0.01. And the significance level of 99.9% is accepted at a p-value less than 0.001.

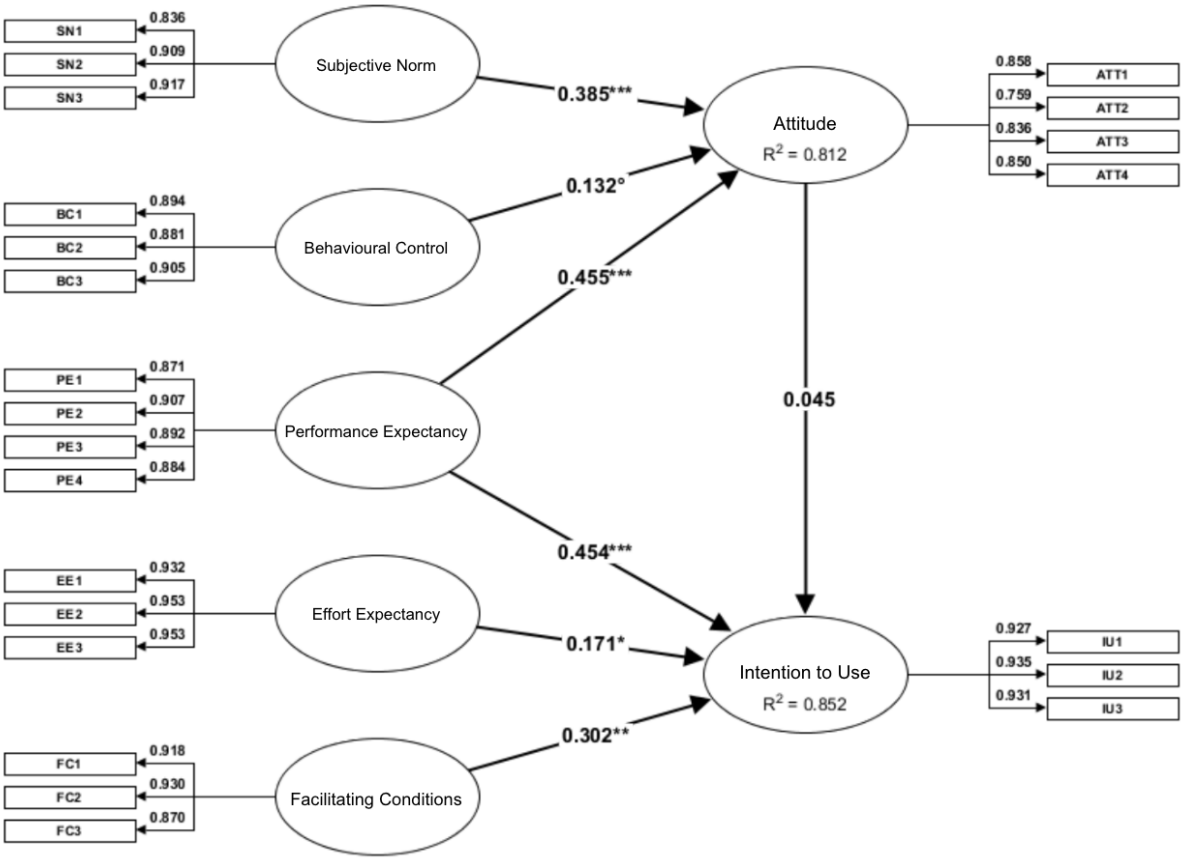

Figure 3. PLS-SEM Model of the Study (SRMR=0.0674)

The PLS-SEM Model of the study is shown with the SRMR=0.0674 which is less than 0.08. It means that the SRMR of this model is acceptable. According to Figure 3, the subjective norm can predict attitude at β=0.385, p<0.001 (two tails at 0.0000 and one tail at 0.0000). Perceived behavioural control can predict attitude at β=0.132, p<0.05 (two tails at 0.0902 and one tail at 0.0451). Performance expectancy can predict attitude at β=0.455, p<0.001 (two tails at 0.0000 and one tail at 0.0000). Performance expectancy can predict intentions to use telemedicine at β=0.454, p<0.001 (two tails at 0.0000 and one tail at 0.0000). Effort expectancy can predict intentions to use telemedicine at β=0.171, p<0.05 (two tails at 0.0165 and one tail at 0.0083). Facilitating conditions can predict intentions to use telemedicine at β=0.302, p<0.01 (two tails at 0.0027 and one tail at 0.0013). Attitude

can be explained by subjective norms, perceived behavioural control, and performance expectancy of about 81.2% (R^2=0.812). However, the attitude has not affected the intention to use telemedicine at β=0.045, p>0.05 (two tails at 0.7346 and one tail at 0.3673). Overall, the relationship phenomenon can be explained by 85.2% (R^2=0.852).

Table 5. Summary of Hypothesis Testing

Hypotheses	Results	Actions
H1: Subjective Norm → Attitude	β=0.385, p<0.001	Supported
H2: Perceived Behavioural Control → Attitude	β=0.132, p<0.05	Supported
H3: Performance Expectancy → Attitude	β=0.455, p<0.001	Supported
H4: Performance Expectancy → Intention to Use Telemedicine	β=0.454, p<0.001	Supported
H5: Effort Expectancy → Intention to Use Telemedicine	β=0.171, p<0.05	Supported
H6: Facilitating Conditions → Intention to Use Telemedicine	β=0.302, p<0.01	Supported
H7: Attitude → Intention to Use Telemedicine	β=0.045, p>0.05	Rejected
H8: Attitude is a significant mediator between subjective norm, perceived behavioural control, performance expectancy and an individual's intention to use telemedicine during the COVID-19 pandemic	p>0.05 R^2=0.812	Rejected

Assumptions

The assumptions of this study reveal that (Table 5):

- H1 (*Subjective norm significantly influences an individual's attitude toward telemedicine usage during the COVID-19 pandemic)* was supported.
- H2 (*Perceived behavioural control significantly affects an individual's attitude toward telemedicine usage during the COVID-19 pandemic)* was supported.
- H3 (*Performance expectancy significantly impacts an individual's attitude toward telemedicine during the COVID-19 pandemic)* was supported.

- H4 *(Performance expectancy significantly impacts an individual's intention to use telemedicine during the COVID-19 pandemic)* was supported.
- H5 (*Effort expectancy impacts an individual's intention to use telemedicine during the COVID-19 pandemic)* was supported.
- H6 (*Facilitating conditions influences an individual's intention to use telemedicine during the COVID-19 pandemic)* was rejected.
- H7 *(Attitude significantly influences an individual's intention to use telemedicine during the COVID-19 pandemic)* was rejected.
- H8 (*Attitude is a significant mediator between subjective norm, perceived behavioural control, performance expectancy and an individual's intention to use telemedicine during the COVID-19 pandemic)* was rejected.

Overall, the relationship phenomenon can be explained by about 85.2% (R^2=0.852).

DISCUSSION

The findings support the conceptual framework of several studies, such as Tan (2013), that the subjective norm and perceived behavioural control significantly influence an individual's attitude toward telemedicine usage among Thai people. Performance expectancy positively impacted behavioural intentions during the COVID-19 pandemic supported by Chua et al. (2018), Tandon, (2021), Muangmee et al. (2021), Sudirman et al. (2022) and Bashir & Madhavaiah (2015). Effort expectancy significantly influenced behaviour confirmed by the study by Puriwat & Tripopsakul (2021), Sudirman et al., (2022), Kurniawati et al. (2021), Musyaffi et al. (2021) and Shafi, & Weerakkody (2009). Facilitating conditions had a significant and positive influence on user behavioural intention that supported the study of Kabra et al. (2017), Puriwat & Tripopsakul (2021), and Kurniawati et al. (2021) and Tandon (2021). However, the attitude does not significantly influence behavioural intention, which is converse to the study Mailizar et al. (2021), Zaman et al. (2021), Husain et al. (2021) and Jandawapee et al. (2022). Moreover, attitude does not significantly mediate an individual's intention to use telemedicine among Thai people through the subjective norm, perceived behavioural control and performance expectancy, which is different from the study of Bananuka et al. (2020) and Zaman et al. (2021).

Therefore, it can be discussed in this study that the TPB model and UTAUT models are related to an individual's intention to use telemedicine. It also confirmed the influence of subjective norms on attitude, the impact of perceived behavioural control on attitude and the influence of effort expectancy on attitude. Moreover, there are the influence of performance expectancy and facilitating conditions on an individual's intention to use telemedicine. This study also confirmed the mediating effect of attitude between the relationships in this PLS-SEM model.

CONCLUSIONS AND RECOMMENDATIONS

The healthcare strategic planners could increase subjective norms by enhancing telemedicine's users' families, and friends use telemedicine during the COVID-19 pandemic. Telemedicine users perceived that they could use telemedicine without help and that telemedicine is helpful for the users. Also, the interaction with telemedicine is easy because the users' living environment supports them in using telemedicine. It saves time in health consultations. Thus, they intend to use telemedicine in the future. The implication could be helpful in any sector to apply the TPB and UTAUT models in explaining individuals' behavioural intentions among customers and citizens. The recommendation is that the researchers should expand more sampling to other countries. The results may explain in general. Also, the qualitative approach for insight is evident in further study.

IMPLICATIONS

It should be noted that UTAUT has become increasingly popular in telemedicine research in recent years based on the evidence of the UTAUT and TPB models in explaining the intention to use telemedicine among Thai people. In addition, UTAUT is robust because it was developed using eight prior technology adoption theories. However, the application of the TPB model has produced contradictory results, influenced only attitude, and had no indirect or direct effect on the intention to use telemedicine. The findings of the direct effect of performance expectancy, effort expectancy, and facilitating conditions on intention to use telemedicine among Thai people will provide additional explanations for other unique phenomena and healthcare contexts. It could be applied to any sector utilising and applying technology to meet the needs and expectations of customers. Additionally, customer satisfaction should be considered as the mediator in further study.

ACKNOWLEDGEMENT

The researchers acknowledge Associate Professor Dr. Suthithep Siripipattanakul from Kasetsart University, for encouraging and guiding this research paper throughout the publication.

CONFLICT OF INTERESTS

There is no conflict of interest.

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