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Long Paper

The UTAUT Model Explaining Intentions to Use Telemedicine Among Thai People During the COVID-19 Pandemic: A Qualitative Study in Krabi, Thailand

Pongsakorn Limna
Rangsit University, Thailand
pongsakorn.l65@rsu.ac.th
ORCID ID: orcid.org/0000-0002-7448-5261
(corresponding author)

Supaprawat Siripipatthanakul
Asia e University, Malaysia
Manipal GlobalNxt University, Malaysia
drsupaprawat@gmail.com
ORCID ID: orcid.org/0000-0001-6671-2682

Sutithep Siripipattanakul
Kasetsart University, Thailand
fedustt@ku.ac.th
ORCID ID: orcid.org/0000-0002-5477-6723

Pichakoon Auttawechasakoon
Burapha University, Thailand
pichchakun4997@gmail.com
ORCID ID: orcid.org/0000-0002-2247-6750

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Abstract

Purpose – This study aims to explain the influence of the unified theory of acceptance and use of technology (UTAUT) model on individuals' intentions to use telemedicine among people in Krabi, Thailand, during the COVID-19 pandemic.

Method – In this study, the qualitative approach was used as a research strategy. In-depth interviews were conducted with six key informants to determine the intention to use telemedicine during the COVID-19 pandemic related to the UTAUT model in Krabi, Thailand. Thematic analysis and NVivo were employed to analyse the qualitative data.

Results – Telemedicine is an essential technology for remote or online consultations between healthcare providers and patients during the COVID-19 pandemic. Moreover, the four key dimensions of the UTAUT model (performance expectancy, effort expectancy, social influence, and facilitating conditions) impact individuals' intentions to use telemedicine during the COVID-19 pandemic in Krabi, Thailand.

Conclusion – Telehealth is an important tool for providing remote healthcare, and its popularity has grown during the COVID-19 pandemic. The UTAUT model adoption is critical as it is related to individuals' intention to use telemedicine.

Recommendations – Healthcare providers and directors should consider the UTAUT model adoption in telemedicine technology because it is related to individuals' intention to use telemedicine during the COVID-19 pandemic and beyond.

Research Implications – This study added to the existing literature on the UTAUT model (performance expectancy, effort expectancy, social influence, and facilitating conditions) to explain telemedicine and intentions to use telemedicine. Hence, this study's findings may aid academics in broadening their research by incorporating more potential elements.

Practical Implications – The study's findings may benefit healthcare providers and directors in developing and implementing a strategy to meet the needs and expectations of individuals or patients using telemedicine during the COVID-19 pandemic and beyond.

Keywords – UTAUT Model, Intentions to Use, Telemedicine, COVID-19 Pandemic

INTRODUCTION

Digital transformation and innovation are critical for organisations to thrive in industry 4.0. Besides, enterprises have consistently invested significant resources in implementing new information technologies (IT) to achieve competitive advantages over

the last few decades (Oliveira et al., 2014; Durmaz et al., 2022; Tajudeen al., 2022). One particularly relevant goal of such IT investments has been to reach out to existing customers and attract new prospective customers through IT-enabled sales and marketing prowess. Unsurprisingly, there has been a surge in interest in information systems (IS) and marketing literature. Recently, an increased stream of research has focused on understanding various determinants perceived as necessary by end customers when adopting new IT-enabled sales channels offered by their providers (Oliveira et al., 2014). Furthermore, in healthcare services provision, technological advancements have changed the way healthcare services are transacted. Telemedicine is one of the most recent developments in this domain, allowing patients to perform healthcare activities online such as health consultations (Haleem et al., 2021; Mbunge et al., 2021).

COVID-19, a global public health emergency, has changed how medical care is delivered to protect health workers while managing available resources (Eccleston et al., 2020). As the world adjusts to the COVID-19 pandemic, patient and healthcare worker safety has become a critical source of contention. Thus, novel methods of providing medical care must be considered. Telehealth, also known as telemedicine, and digital healthcare are essential medical services delivered through information and communication technology (ICT) and high-speed telecommunication systems. These medical services enable healthcare providers to provide patients with safe, timely, and high-quality ambulatory care (Anthony, 2021; Søvold et al., 2021).

The unified theory of acceptance and use of technology (UTAUT) is a model of individual acceptance that aims to integrate disparate concepts and research on personal acceptance of information technology. The unified theoretical model of four key dimensions (performance expectancy, effort expectancy, social influence, and facilitating conditions) account for dynamic effects such as gender, age, voluntariness, and experience (Kiwanuka, 2015; Limna et al., 2022, a). The UTAUT model is essential for studying an individual's behavioural intention (Patil et al., 2020). Therefore, the UTAUT model is critical to study because this model can be used to investigate individuals' intentions to use telemedicine during the COVID-19 pandemic.

Research Objective

This study aims to explain the influence of the UTAUT model on intentions to use telemedicine among people in Krabi, Thailand, during the COVID-19 pandemic.

Research Question

How does the UTAUT model influence people's intentions to use telemedicine in Krabi, Thailand, during the COVID-19 pandemic?

LITERATURE REVIEW

The COVID-19 Pandemic in Thailand

Since January 2020, the pandemic caused by the coronavirus disease 2019 (COVID-19) has had a profound effect on global morbidity and mortality. Moreover, the COVID-19 outbreak has posed significant challenges, such as economic and social disruptions, to many counties, including Thailand (Clerkin et al., 2020; Srichannil, 2020; Jandawapee et al., 2022). COVID-19 posed a challenge to many systems, including healthcare systems and altered population lifestyles, reshaped energy consumption and the living environment in the society, and set off a chain reaction in the healthcare–energy–environment system. The consequences of countries' varying degrees of implementation of public health and social policies are evident in their widely disparate disease burdens and levels of disruption to public health systems (Jiang et al., 2021; Nittayasoot et al., 2021). Furthermore, demands for response to the COVID-19 pandemic quickly outstripped global resources. Successful application of technology resulting in people taking greater control of their health and medical and public health personnel increasing their efficiency was requested by Thai authorities to reduce the demand on health resources to meet the population's health needs. Implementing real-time application technologies from the bottom up to identify COVID-19 is challenging and highlights control measures (Intawong et al., 2021). Therefore, the COVID-19 pandemic is a critical topic to study, especially its impact on the healthcare sectors.

The UTAUT Model

The unified theory of acceptance and use of technology (UTAUT) model has been widely used as a theoretical lens by researchers conducting empirical studies of user intention and behaviour in technology adoption and diffusion research (Williams et al., 2015). The model was initially developed to investigate technology adoption in the workplace. It was then expanded to investigate the factors influencing individual innovation adoption in various contexts (Arfi et al., 2021). Venkatesh et al. (2003) developed a comprehensive UTAUT based on a thorough review of eight dominant technology adoption models: the theory of reasoned action (TRA), the technology acceptance model (TAM), the motivational model (MM), the theory of planned behaviour (TPB), the combined TAM and TPB (C-TAM-TPB), the model of personal computing utilisation (MPCU), the innovation diffusion theory (IDT), and the social cognitive theory (SCT). The UTAUT postulates performance expectancy, effort expectancy, and social influence as direct determinants of behavioural intention that affect use behaviour together with facilitating conditions (Patil et al., 2020). Additionally, the UTAUT model suggests that four core constructs (performance expectancy, effort expectancy, social influence, and facilitating conditions) are direct predictors of behavioural intention and,

ultimately, behaviour and that these constructs are moderated by gender, age, experience, and voluntariness of use (Arfi et al., 2021; Limna et al., 2022, a).

In healthcare sectors, the UTAUT model is used to measure the acceptance of technology in an organisational environment, the consumer perspective and the healthcare context, such as electronic health applications (Arfi et al., 2021; Gu et al., 2021), mobile health applications (Garavand et al., 2019; Petersen et al., 2020), home telehealth services (Cimperman et al., 2016), and home healthcare robot adoption (Vichitkraivin & Naenna, 2021). Thus, the UTAUT model is critical to consider in the healthcare context. This study investigates the influence of the UTAUT factors (performance expectancy, effort expectancy, social influence, and facilitating conditions) on individuals' intentions to use telemedicine among people in Krabi, Thailand, during the COVID-19 pandemic.

Performance Expectancy

Performance expectancy, a significant determinant of the UTAUT model, is the extent to which an information system or technology will benefit consumers when performing specific activities (Limna et al., 2022, a). Similarly, performance expectancy also refers to how adopting a technology increases users' effectiveness in performing specific tasks (Wang et al., 2020). Performance expectancy has a significant impact on mobile service adoption (Yuduang et al., 2022). In the context of wearable medical devices, effectiveness can be defined as the device's ability to assist consumers in monitoring daily physical conditions, developing self-care plans, and minimising threats to one's health. Therefore, in the healthcare context, performance expectancy refers to the degree to which one believes that the system will improve end users' healthcare experiences. An increase in end-user performance expectancy of connected healthcare devices, such as the perception of more effective health management, better access to healthcare services, and overall quality of life, has a positive effect on end-user ease of use of connected healthcare devices (Arfi et al., 2021; Lee et al., 2021).

Effort Expectancy

Effort expectancy, one of the essential determinants of the UTAUT model, refers to the degree of ease associated with using the system (Chen et al., 2021). Effort expectancy is an important predictor of technology acceptance because it is related to the user's expectation of ease (Harja et al., 2021). Effort expectancy in the UTAUT model is similar to perceived ease of use in the TAM model, complexity in the MPCU model, and ease of use in the IDT model. Hence, effort expectancy is the degree of convenience perceived for using the system (Ayaz & Yanartaş, 2020; Patil et al., 2020). Furthermore, when many people use technology, it demonstrates that it is simple to use. As a result, people who use information technology (IT) innovations will naturally demand ease of use (Limna et al., 2022, a). In end-user use of connected healthcare devices, effort expectancy is associated

with an increase in a technology's perception as being more beneficial and useful (Arfi et al., 2021).

Social Influence

Social influence, one of the major determinants of the UTAUT model, refers to the degree to which an individual perceives the importance of peer opinions on whether they should use the new system (Venkatesh et al., 2003; Wu et al., 2022) Similarly, social influence is a behaviour change caused by one person on another, whether intentional or unintentional, and it can occur in any situation. Furthermore, social influence has been called various names, including social factors or subjective norms (Limna et al., 2022, a). Social influence is a person's perception of the need to behave in a certain way to meet social pressure, and people change their beliefs or actions to meet the demands of a social group (Mei & Aun, 2019). Moreover, the literature on predicting patient behaviour in the acceptance of information communications technologies (ICTs) in healthcare has revealed that social influence is a significant determinant, as peer and colleague opinions strongly influence user behaviour. Social influence also plays a complex role in accepting new technologies (Arfi et al., 2021).

Facilitating Conditions

Facilitating conditions, one of the UTAUT model's significant determinants, refer to an individual's belief in the existence of an organisational and technical infrastructure to support technology use. The simpler and easier it is for people to access technology, the more proficient they become at using it, resulting in a higher rate of technology adoption. Facilitating conditions are similar to perceived behavioural control in the TPB model, DTPB model, C-TAM-TPB model, facilitating conditions in the MPCU model and compatibility in the IDT model (Limna et al., 2022, a). Convenience perceptions (i.e., having resources and support to use technology) have a direct influence on behavioural intentions to use technology (Yuduang et al., 2022). Facilitating conditions may positively impact consumers' perceptions of the ease of use of connected devices. Previous research has found a relationship between the availability of technological resources and technical infrastructure and their perceived usefulness. In addition, there is a positive relationship between the perceived usefulness of using connected devices and the associated facilitating conditions (Arfi et al., 2021; Grandhi et al., 2021).

Telemedicine

Telemedicine, also known as telehealth, is the practice of providing healthcare and exchanging health-related data across geographical boundaries. It is not a new novel or unusual branch of medicine. Moreover, telemedicine episodes are classified into two major categories: first, the nature of the interactions between patients and experts, such as live

or prerecorded, and second, the type of information transmitted, such as text, audio, and video (Limna et al., 2022, b). Telemedicine is beneficial as it has the potential to help by providing mildly ill patients with necessary supportive care while limiting their exposure to other acutely ill patients. A computer virus is the only infection that a telehealth technology user can contract (Portnoy et al., 2020; Sim & Lee, 2021).

The telemedicine platform is critical in bringing the COVID-19 epidemic under control. Several digital technology platforms, including telemedicine, have been used by healthcare providers to connect patients, experts, and information management for COVID-19 patients. Furthermore, telemedicine has provided prevention and treatment guidance, training, communication, and remote consulting to community residents and medical staff (Calton et al., 2020; Song et al., 2020). The telemedicine revolution has increased access to essential health care during an unprecedented public health crisis in response to COVID-19. On the other hand, virtual patient care can jeopardise the patient-provider relationship, examination quality, health care delivery efficiency, and overall quality of care (Perakslis & Stanley, 2021; Reeves et al., 2021). Telemedicine has grown in popularity, and remote care trends align with social distancing guidelines. Training healthcare providers to use telemedicine to deliver high-quality, safe, and personalised health care will prepare the next generation of physicians to use these technologies responsibly and meet the growing demand for telehealth services (Daniel et al., 2015; Kichloo et al., 2020). Therefore, telemedicine can be used to keep not only patients but also healthcare workers safe during the COVID-19 pandemic by maintaining distance and preventing transmissions (Limna et al., 2022, b).

Intention to Use Telemedicine

Telemedicine applications for health promotion, social services, and other activities are intended to provide services outside of clinical settings in homes, schools, and other governmental and community locations. Examples include health information websites, online support groups, automated telephone counselling, interactive health promotion programs, and electronic mail exchanges (Limna et al., 2022, b). Several factors affect an individual's intention to use telemedicine. Perceived ease of use on, perceived usefulness and attitude toward telemedicine use are significant determinants of an individual's intention to use telemedicine. Privacy concerns and outcome beliefs also significantly impact individuals' attitudes toward telemedicine (Singh & Dev, 2021). Perceived behavioural control and subjective norm are also powerful predictors of behavioural intention to use telemedicine (Pikkemaat et al., 2021). Hence, the intentions to use telemedicine are related to individuals' perceptions. In addition, individuals' intentions to use telemedicine could be improved by focusing on the factors that are associated with their intentions (Ly et al., 2018; Limna et al., 2022, b).

METHODOLOGY

Qualitative research aims to investigate every context in which people or groups make decisions and act and explain why that specific observed phenomenon occurred (Siripipatthanakul et al., 2022). The qualitative approach consists of four primary research steps: question design, data collection, data analysis, and report writing (Levitt et al., 2021; Tong-On et al., 2021). Furthermore, in-depth interviews provide comprehensive answers on a specific topic; thus, accurate information is obtained to meet the research objectives (Limsakul & Kraiwanit, 2020). In this study, the qualitative approach was used as a research strategy. In-depth interviews with six key informants, who were telemedicine users, were conducted to determine the intention to use telemedicine during the COVID-19 pandemic related to the UTAUT model in Krabi, Thailand.

Study Population and Sample

Purposive sampling entails the researchers selecting the most useful sample based on their knowledge. In qualitative research, this technique is frequently used. The aim is to acquire in-depth knowledge of a specific phenomenon or population (Siripipattanakul et al., 2022). The sample of this study consisted of six key informants who were telemedicine users in Krabi, Thailand. The data was collected through purposive sampling. The criteria of participants include: 1) the participants were Thai in Krabi, 2) the participants usually used telemedicine, 3) the participants' age was over 18 years old, and 4) the participants had perceptions and knowledge about telemedicine.

Data Collection

The researchers reviewed the secondary data (documentary method) for appropriate key survey questions through in-depth interviews to accomplish the primary data results. The following is a list of the survey interview questions.

Q1: Do you expect or perceive that telemedicine benefits you, and why?
Q2: Do you expect or perceive that telemedicine will be effective for you, and why?
Q3: Do you expect or perceive telemedicine requires new skills, and why?
Q4: Do you expect or perceive that telemedicine is easy to use, and why?
Q5: Do you expect or perceive that using telemedicine fits well with your lifestyle?
Q6: Do you find telemedicine satisfying to use, and why?
Q7: Do you think you will recommend telemedicine to your peers, and why?
Q8: Do you think you will use telemedicine after the COVID-19 pandemic, and why?

Data Analysis

Thematic analysis is an excellent approach to qualitative research. A researcher attempts to discern something about people's views, opinions, knowledge, experiences, and values from a collection of qualitative data, such as interview transcripts and social media profiles survey responses. In addition, intelligent verbatim transcription is also recommended for research analysis (Castleberry & Nolen, 2018). Hence, the researchers employed thematic analysis and the NVivo Trial Version to analyse the qualitative data through in-depth online and face-to-face interviews in this study.

RESULTS

Six telemedicine users (three providers and three receivers) in Krabi, Thailand, participated in this study. In addition, the six participants were three females and three males, all over the age of 18 and all from Krabi, Thailand.

Table 1. Demographic Profile of the Respondents

No.	Interview Date	Occupation	Gender	Age
1	May 02, 2022	Doctor	Male	28
2	May 02, 2022	Pharmacist	Male	29
3	May 03, 2022	Nurse	Female	49
4	May 03, 2022	Business Owner	Female	36
5	May 04, 2022	Teacher	Female	42
6	May 04, 2022	Police Officer	Male	41
	Total	**6**	**3 Males , 3 Females**	**Average = 38.5**

Performance expectancy impacts individuals' intention to use telemedicine during the COVID-19 pandemic.

Referring to the interviews, most of the respondents stated that telemedicine was useful for them. Using telemedicine would save both patients and healthcare workers time in healthcare consultations during the COVID-19 pandemic because they could use telemedicine anyplace through devices. Therefore, they would use telemedicine if it could benefit them when performing specific activities.

"As a doctor, I think telemedicine is very beneficial to my patients and me. Patient and healthcare workers' safety is important during the COVID-19 pandemic. I usually use the LINE app to video call my patients for medical consultations. So, it is very effective." – Respondent 1: a 28-year-old male, interviewed on May 02, 2022, at 10:00 am.

"I think telemedicine is beneficial to me. I am a hard-working person, and I am always busy. I do not have time to visit *a hospital, and using telemedicine can help me solve this problem very well. It is excellent. So, I have to say I am satisfied with it."* – Respondent 4: a 36-year-old female, interviewed on May 03, 2022, at 01:00 pm.

"Well, using telemedicine would save my time in healthcare consultations during the COVID-19 pandemic. I can video call my doctor from home, and the hospital also provides good services. For example, they would mail me my prescriptions." – Respondent 5: a 42-year-old female was interviewed on May 04, 2022, at 09:00 am.

Effort expectancy impacts individuals' intention to use telemedicine during the COVID-19 pandemic.

Referring to the interviews, most of the respondents stated that learning to use telemedicine was simple, and interactions with telemedicine were also easy for them. Moreover, telemedicine usage made healthcare consultations easier for both patients and healthcare workers during the COVID-19 pandemic as they did not have to go to a hospital or a clinic. Thus, they would use telemedicine if it was easy to use.

"It is simple for me to use telemedicine. Some of my customers use telemedicine as well. When they require a service from my pharmacy store, they will simply use the LINE app. So, I have to say telemedicine is easy to use for everyone at every age." – Respondent 2: a 29-year-old male, interviewed on May 02, 2022, at 01:00 pm.

"Well, it is easy for me to develop telemedicine skills. I am a teacher, and I am always willing to learn. Moreover, as a result of COVID-19, I have learned a lot of new things, including telemedicine. I have to say I am satisfied as it is very easy, convenient, and useful. So, I will likely continue to use telemedicine after the COVID-19 pandemic, too." – Respondent 5: a 42-year-old female interviewed on May 04, 2022, at 09:00 am.

"I am always on my social media platforms, especially on Facebook and LINE apps. So, it is effortless. It is not something new to me. Telemedicine is not that difficult to use. I have recommended some of my friends to use telemedicine, and they seem very happy with it." – Respondent 6: a 41-year-old male was interviewed on May 04, 2022, at 11:00 am.

Social influence impacts individuals' intention to use telemedicine during the COVID-19 pandemic.

Referring to the interviews, most respondents stated that telemedicine was widespread as many people used it. Also, they used telemedicine during the COVID-19 pandemic because of recommendations from their families and peers. Therefore, they would use telemedicine if recommended by their families and peers.

"My friends recommended telemedicine to me, and I then recommended and taught my family to use it so that they did not have to visit a hospital if not necessarily. They also mentioned that telemedicine is going to be popular, especially during the pandemic." – Respondent 3: a 49-year-old female, interviewed on May 03, 2022, at 10:30 am.

"A good friend of mine influenced my decision to use telemedicine. I used it. It was good, and I also recommended that my family and friends use it, too." – Respondent 4, a 36-year-old female, was interviewed on May 03, 2022, at 01:00 pm.

"My doctor, who is also my good friend, actually advised me to use telemedicine as I could not go to the hospital during the COVID-19 pandemic. I have been using it." – Respondent 5: a 42-year-old female, interviewed on May 04, 2022, at 09:00 am.

Facilitating conditions impact individuals' intention to use telemedicine during the COVID-19 pandemic.

Referring to the interviews, most of the respondents stated that they had the internet and devices necessary, including basic knowledge, to use telemedicine. Moreover, they could get help if they had problems using telemedicine. Thus, they would use telemedicine if assistance was available when it was needed, and telemedicine was compatible with the technologies.

"At the hospital. I have got all the needed resources for telemedicine, including my smartphone, computer, internet, etc. I have to say my working environment supports me, as a medical provider, to use telemedicine." – Respondent 1: a 28-year-old male, interviewed on May 02, 2022, at 10:00 am.

"Well, I have the internet and devices to use telemedicine. However, if I have a problem, I have my son who can help me. He is very good at technology and stuff." – Respondent 5: a 42-year-old female, interviewed on May 04, 2022, at 09:00 am.

"So, I have the necessary devices to use telemedicine. Moreover, my living environment also supports me in using telemedicine. My wife is a registered nurse. If I need to

use telemedicine with my doctor, and there is a problem, she can help me more." – Respondent 6: a 41-year-old male interviewed on May 04, 2022, at 11:00 am.

NVivo Analysis

In this study, the collected data through in-depth face-to-face interviews were analysed using the content analysis method. *Also*, the interpretation and analysis were based on NVivo (trial version), a qualitative data analysis software.

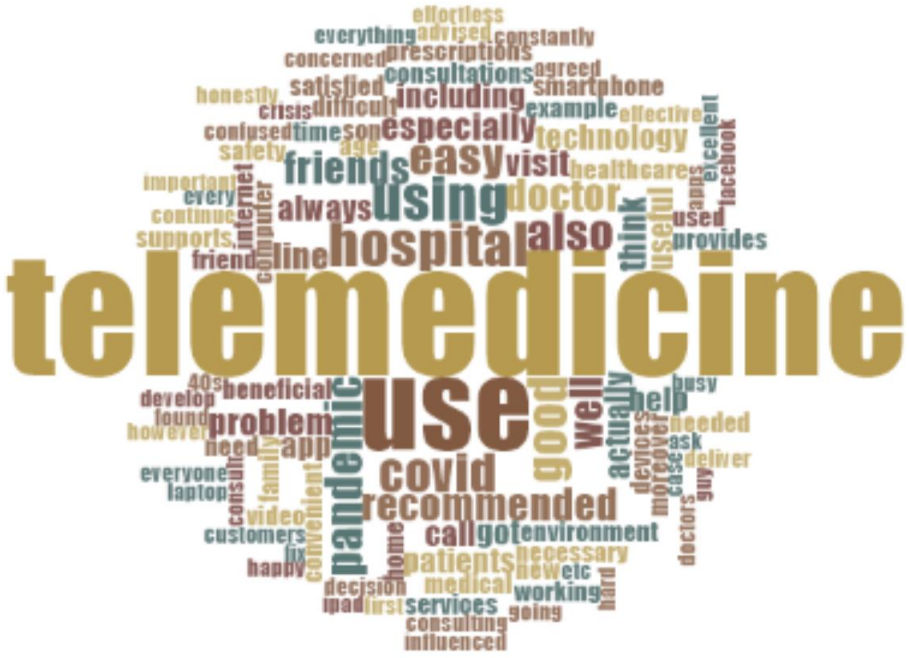

Figure 1. Word Frequency Query – Word Cloud

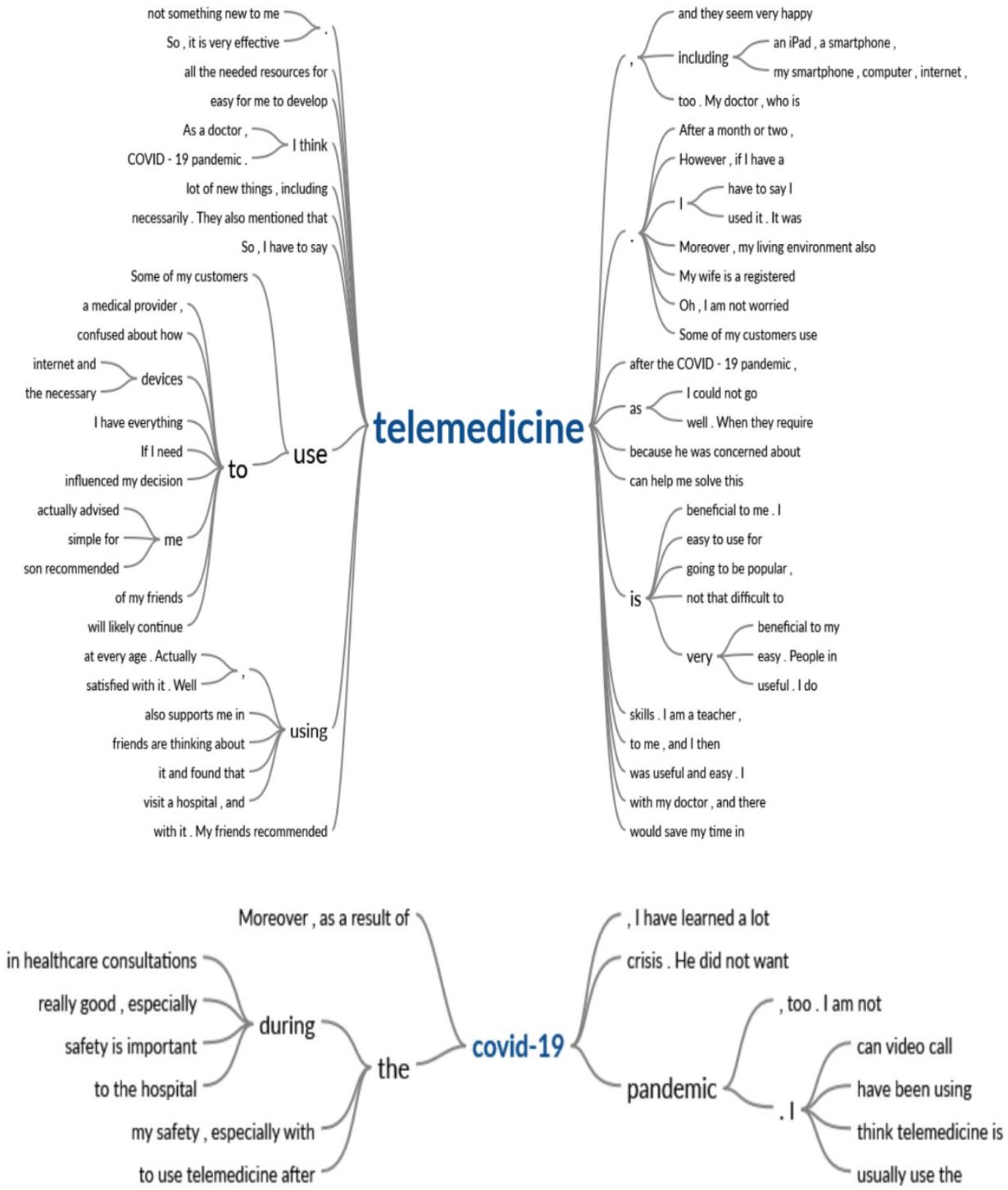

Figure 2. Text Search – Word Tree

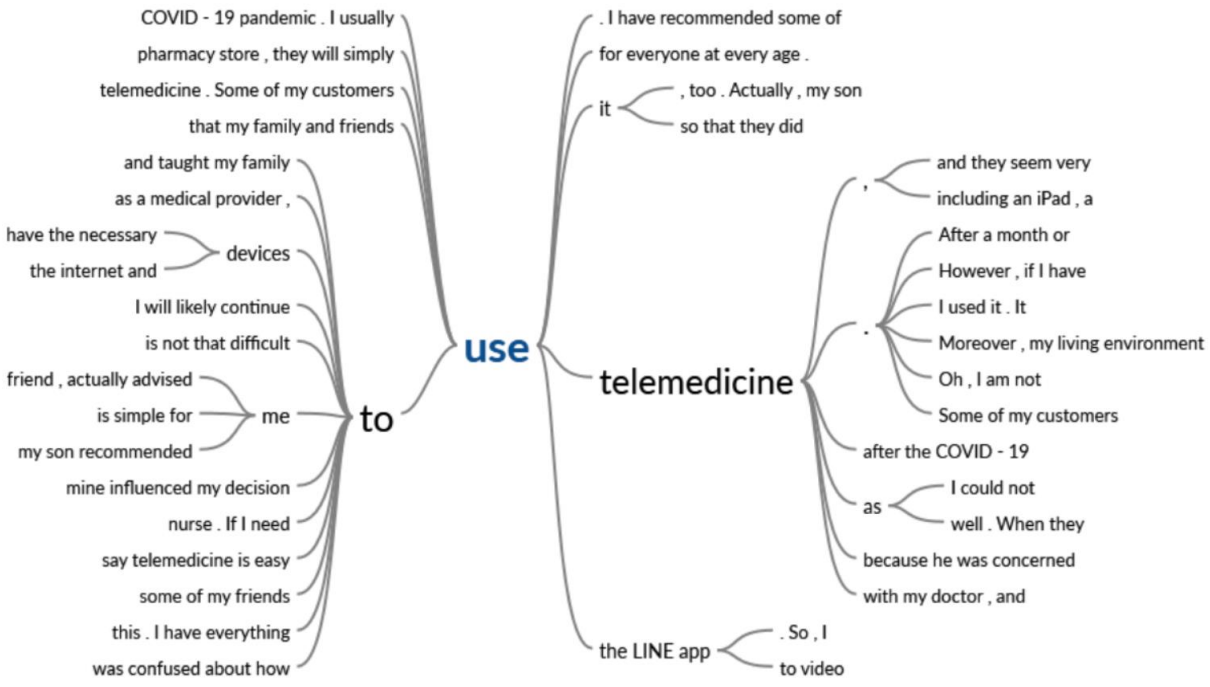

Figure 2. Text Search – Word Tree (cont.)

DISCUSSION

Telemedicine is a critical technology for consultations between healthcare providers and patients *during* the COVID-19 pandemic. Moreover, the four key dimensions of the UTAUT model (performance expectancy, effort expectancy, social influence, and facilitating conditions) impact individuals' intentions to use telemedicine during the COVID-19 pandemic in Krabi, Thailand. The findings supported the previous research of Limna et al. (2022, b) that telemedicine was an essential technology for consultations between healthcare providers and patients during the COVID-19 pandemic. Furthermore, the findings supported the previous research of Arfi et al. (2021) that performance expectations significantly influenced individuals' intentions. The findings also supported the previous research of Singh & Dev (2021) that effort expectancy significantly influenced an individual's intention.

The findings supported the previous research of Arfi et al. (2021) and Pikkemaat et al. (2021) that facilitating conditions and social influence impacted an individual's intention. Finally, the findings supported the previous research of Limna et al. (2022, a) and Yuduang et al. (2022) that there was a significant relationship between the four factors of the UTAUT model (performance expectancy, effort expectancy, social influence, and facilitating conditions) and individuals' intentions.

CONCLUSIONS AND RECOMMENDATIONS

Telemedicine, as known as telehealth, is an essential tool for providing remote or online healthcare, and its use has grown in the COVID-19 pandemic. Furthermore, the adoption of the UTAUT model is critical because it relates to individuals' intention to use telemedicine. It is suggested that the UTAUT model adoption in telemedicine technology be considered because it is related to individuals' intentions to use telemedicine. To increase individuals' intention to use telemedicine, healthcare providers and directors should consider facilitating conditions such as providing service to assist users or patients when needed and ensuring telemedicine tools are compatible with the technologies that most people use.

Furthermore, healthcare providers and directors should consider performance expectancy by, for example, increasing users' perceptions of the benefits of telemedicine, especially during the COVID-19 pandemic. It is also critical to consider effort expectancy, such as ensuring that telemedicine is simple. In addition, family, friends, and healthcare influencers may contribute to establishing social influence, which increases intentions to use telemedicine. As a result, healthcare providers and directors can develop an effective strategy to meet the needs and expectations of individuals or patients who wish to use telemedicine during the COVID-19 pandemic.

IMPLICATIONS

The study's findings may aid healthcare providers, healthcare directors, and marketers develop and implement an appropriate strategy to meet the needs and expectations of individuals or patients who wish to use telemedicine during the COVID-19 pandemic beyond. Moreover, this study added to the existing literature on the UTAUT model (performance expectancy, effort expectancy, social influence, and facilitating conditions), telemedicine, and intention to use telemedicine. Hence, this study's findings may aid academics in broadening their research by incorporating more potential elements. The measurements could be used to guide future research on the four dimensions of the UTAUT model (performance expectancy, effort expectancy, social influence, and facilitating conditions), telemedicine, and intention to use telemedicine.

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