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A Study On The Awareness And Satisfaction Assessment In Telemedicine Services During Covid 19 Pandemic In Thailand

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Abstract

This study examines the determinants of the acknowledgment and understand how Thai people have connected, used and measured the level of satisfaction and restriction of telemedicine in the period of medical in person limitation, mainly based on covid-19 pandemic announced worldwide. The aim of this study is to use the findings of data from 352 surveys from Thai people in various ages of group in a set of questions related to the attitudes and opinions about the awareness and the satisfaction of telemedicine services along with the gather information from the overview study of current knowledge so as to apply with a comprehensive summary on the topic. This questionnaire and literature review is a basic tool to analyse and evaluate for the better development in the future of Thailand's medicine industry, with attention to the telemedicine service. The findings showed and supported that concerns need to be raised regarding patient trust and, more crucially, patient awareness of telemedicine. For future practises in Thailand during and after COVID-19, preparation, education, and the development of a clear framework for telemedicine may be required.

Keywords: : telemedicine, covid-19, telehealth, Thailand, survey

Introduction

Problem statement and Research purpose

Nowadays Thailand has shortages of medical physicians and is facing poor healthcare quality and inequality, especially in rural and remote areas [2]. From the benchmark of the World Health Organisation (WHO), the optimal doctor-population ratio is 1:1000. Even though the Ministry of Public Health have collaborated with the country's medical schools to produce the physicians who spend at least one year working at rural regions hospitals, the Thai medical system is still slightly below than the benchmark at 0.92:1000 [8] which compared to other countries such as Europe with 1 per 800 and Japan with 1 per 600 [2,9]. The medical system in Thailand should be reorganised for citizens to solve the current problems.

In the Covid-19 pandemic, an inevitable situation of lacking frontline healthcare workers due to overload of patients and unable to work as getting the infection brings about the combination with modern technologies and digitals communications where it no longer is a requirement to be able to treat many symptoms or diagnose problems in a face to face environment [5]. Therefore to minimise the spread and improve efficiency of providing medical care, many private medical centres and government hospitals have provided treatment with technologies, telemedicine. [6]

The extraordinary widespread adoption of telemedicine platforms has become an essential component of the medical response to Covid-19 outbreak which plays a role as the alternative official visit to deliver information, advice, diagnosis and

treatment instead of former medical treatment [14]. Refer to the Department of Medical Service,Ministry of Public Health, issue 9 on April 2021, these make the telemedicine services enable healthcare to be met and applied with the regulation of home isolation and Hospitels while reducing exposure for patients and medical staff [12]. However, due to many obstacles such as unavailability of an appropriate infrastructure , the insufficient data security system, awareness of people and the lack of resources have made telemedicine engagement facing the crucial challenges and the difficulties. [18]

The study on awareness and satisfaction assessment in telemedicine services during Covid-19 pandemic in Thailand is to examine the determinants of the acknowledgment and understand how Thai people connect, use and measure the level of satisfaction and restriction of telemedicine in the period of medical in person limitation. The practical insight obtained from the questionnaire survey and use the survey result to analyse how to increase the recognition and better development for the technology of telemedicine services in Thailand.

Objectives of the study

The study's main objective is to determine the prospective Thai people's perception towards telemedicine services which reveal the understanding and acknowledgement of the background knowledge to use the telemedicine technologies during the Covid-19 pandemic time. Moreover, to identify the key factors that influence the use of telemedicine segmentation across demographic (age, gender, education etc), the advance of technologies and accessibility of media devices. Last but not least, rate how the situational factors affect the acceptance to use telemedicines as well as to present the points of view that telemedicine can be promoted and motivated for future development of healthcare organisations in Thailand. In addition, findings in this study could be added on to the existing literature or further research.

Literature review

Telemedicine definition and concepts

Telemedicine is an umbrella term that refers to the remote delivery and the exchange of health-care information or e-health which is reshaping the future for healthcare providers and patients in the new form of digital or not face-to-face communication [4]. The prefix 'tele' derives from the Greek for 'at a distance', so telemedicine is mentioned as medicine carried out over a distance[7]. It is the use of technology such as video or phone calls between a patient and their health care provider without being in the same room and encompasses the whole range of medical activities including diagnosis, treatment and prevention of disease, continuing education of health care providers and consumers, and research and evaluation [5]. Therefore, telemedicine can be defined as: "Rapid access to shared and remote medical expertise by means of telecommunications and information technologies, no matter where the patient or the relevant information is located." [7]

One part of telehealth is telemedicine, which takes advantage of the current internet and mobile connectivity situation including tele-care that have some overlap in working [17]. In fact they are not the same. In Thailand, despite being used interchangeably, telehealth by definition refers to medical services provided by professionals from all healthcare fields, whereas telemedicine solely refers to services provided by physicians [18]. And tele-care focused on the pre and post medical services, not the medical treatment. Telemedicine systems consist of an interface between hardware, software and a communication channel to eventually bridge between two locations to exchange information and enable consultation. The hardware includes a computer, printer, scanner, videoconferencing equipment etc. The software enables the acquisition of patient data like images, reports, films etc. Lastly, videoconferencing, mobile applications, and secure messaging are examples of the communication channel whereby it will connect the two places between patient part and physician part [19].

Telemedicine easily shortens the amount of time needed to connect with the validated physicians and as it has the potential to reach much further distance, telemedicine offers a way to facilitate healing especially in the rural areas where the onsite medical service still is the key trouble[7]. Other positive views include to relieve staff shortages, to empower more knowledge transfer, to increase the availability of medical professionals, the reduction of patients missing their appointments, and also to grow revenues of the physician. Nonetheless telemedicine technology does not 100% replace the need for face

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to face meetings, as many technical operations still cannot do it through video calls. Another barrier should not be ignored, that is the connectivity issues. To succeed in providing the options of telemedicine, a stable Internet connection must be attainable to provide patients with the best possible outcomes[6]. Last but not least, the culture and mindset of people in different societies and countries. India, for example, Indian people believe that a doctor is treated as God's hand therefore, they want the doctor to touch them to get healed. For this reason, telemedicine doesn't have much of an impact in the Indian healthcare system [15].

History of telemedicine

The first telemedicine began in the early 1960s with the purpose of NASA in putting efforts to the development of telemedical capabilities for diagnosis and treatment of medical emergencies, establishment of health maintenance systems, and biomedical experimentation according to NASA's scientists were concerned about the physiological ill effects of zero gravity on astronauts. [2,4,18]

Later on, the early definitions of the telemedicine, Bird KT 1971, who can justifiably be considered the pioneer of telemedicine with the original official definition of telemedicine as "the practice of medicine without the usual physician-patient confrontation via an interactive audio-video communications system" [4]. In 1997, WHO was defined as "The delivery of health care services by all health care professionals using technology for the exchange of valid information for the diagnosis, treatment, and prevention of diseases and injuries"[11]. When the World Cup was co-sponsored by Japan and South Korea; then, the two countries became linked by an extremely high-speed Internet connection [20]. This made Telemedicine first applied between Japan and South Korea in 2002. The technology is not restricted to advanced countries: it can also be applied in developing nations, and it has expanded rapidly to other parts of Asia and beyond [2].

In Thailand, the Pursuant to the Medical device ACT 2008 as amended (MDA), the term "medical devices" is broadly defined to include not only hardware but also software intended to be used for medical purposes. In 2005 Thailand became the seventh country to be associated with the Telemedicine Development Center of Asia (TEMDEC). Then on 21 November 2014, Thailand entered into the ASEAN Agreement on Medical Device Directive and since that date, Thailand has been committed to undertaking all necessary measures regarding medical devices to comply with the provisions started therein. As a result, in 2019, legislation to amend the MDA was passed and that is when Telemedicine started to be further developed in Thailand. [23]

Telemedicine in Thailand

Although telemedicine had been introduced in Thailand around 20 years prior, it has not been extensively utilised in the majority of our hospitals and the infrastructure still falls behind the other countries in the world. Instead several hospitals have been using Line application or telephone call to engage with patients which have no medical records through these platforms. [2]

According to an up to date database provided by the WHO, in Thailand the key barriers to implementing telemedicine include the perceived high costs, the underdeveloped infrastructure, an insufficient framework for policies, the lack of demand by health professionals, and no nationally adopted standards[1]. Recently, the Medical Council of Thailand has published a Telemedicine Guideline with the goals of establishing standards for both healthcare recipients and providers[2]. That will be a strong indication to keep using telemedicine to make sure patients are treated securely and safely. With less transportation and waiting time, and lower costs for patients, telemedicine would have set itself as the "new normal" in the provision of medical and health services during covid era [13].

The first health institution to participate in telemedicine was Siriraj Hospital, and then King Chulalongkorn Memorial Hospital followed two years later. They are two main public hospitals for Thai people. In Thailand, 74.5% of all telemedicine activities are carried out by these two institutions. Bangkok has 14 times more telemedicine activities than other cities, making it the centre of the industry. Thus, it had to think about extending into remote locations and into numerous specialisations aside from surgery and endoscopy. [2]

Thailand is transforming into an ageing society as well as facing the dramatic rise in infectious Covid-

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19 since March 11, 2020 which WHO declared COVID-19 a global pandemic. In order to increase opportunities for Thai people for obtaining medical and health services with equality, the eHealth strategy for 2017 – 2026 is outlined by the Ministry of Public Health. Regarding the strategy, eHealth development in Thailand has four phases as follows:

1. Investing and building a foundation for the eHealth development phase which is planned to take 1 year and 6 months.
2. The eHealth inclusion phase aims at involving all sectors of Thailand to eHealth operations. This phase is planned to take 5 years.
3. The eHealth transformation phase aims to leverage digital innovation to propose innovative medical services. It is estimated to take 10 years to achieve such a goal.
4. eHealth leadership phase to create real economic value in the public health system and to provide good quality of life to Thai people. This big step will take 20 years.

Therefore, telemedicine in Thailand is not new and its use has been accepted over time, especially during the Covid-19 outbreak where the rate of telemedicine use has rapidly increased in Thailand in response to the situation. [1,16,21,22]

Methodology

Research designs

The study was conducted and used by two research methods: exploratory research and mixed method research.

Exploratory Research Design

The method of exploratory research is the secondary research method which was extracted from published sources such as Google scholar, research papers and academic journals online.

Mixed-Methods Research Design

The method of Mixed-Method research is an online questionnaire survey of which the purpose is to apply both quantitative and qualitative (descriptive) research elements to gain a conclusion for the study.

Sample population

In this study, the non probability accidental sampling method was used to select the samples. The selection criterias are as follows: 1. Willingness and consent to cooperate in research 2. Participants lived in Thailand during Covid-19 situation. A total number of respondents 352-person were obtained.

Research tools

A self-report questionnaire was administered using online google form with a total of 17 to 26 questions given to the participants. This instrument was composed into 4 sections.

1. Demographics and behaviours characteristics. (8 questions)
2. Background knowledge and awareness about telemedicine (4 questions)
3. Telemedicine points of view and opinion for future (5 to 15 questions)
4. Level of willingness to use telemedicine for 1 item, yes, no and not sure

Data collected

The findings and recommendations will be analysed and discussed to acquire the relevant data. The method of data collection that the researcher used was a questionnaire in online Google Form where these questions were developed, tested, and given out to respondents living in Thailand through online channels, social groups and more within the approximate 5-minutes time limit in answering.

Other than questionnaires, the participants need to sign a consent form for using information in this study (PDPA- Personal Data Protection Act concern). In this way, all the information can be ensured that it was collected ethically and all the personal information or data will be kept concealed and used for the research purposes only.

Data analysis

Analysis that used in the study is descriptive statistics such as percentage, mean and standard deviation as well as spearman's rank test.

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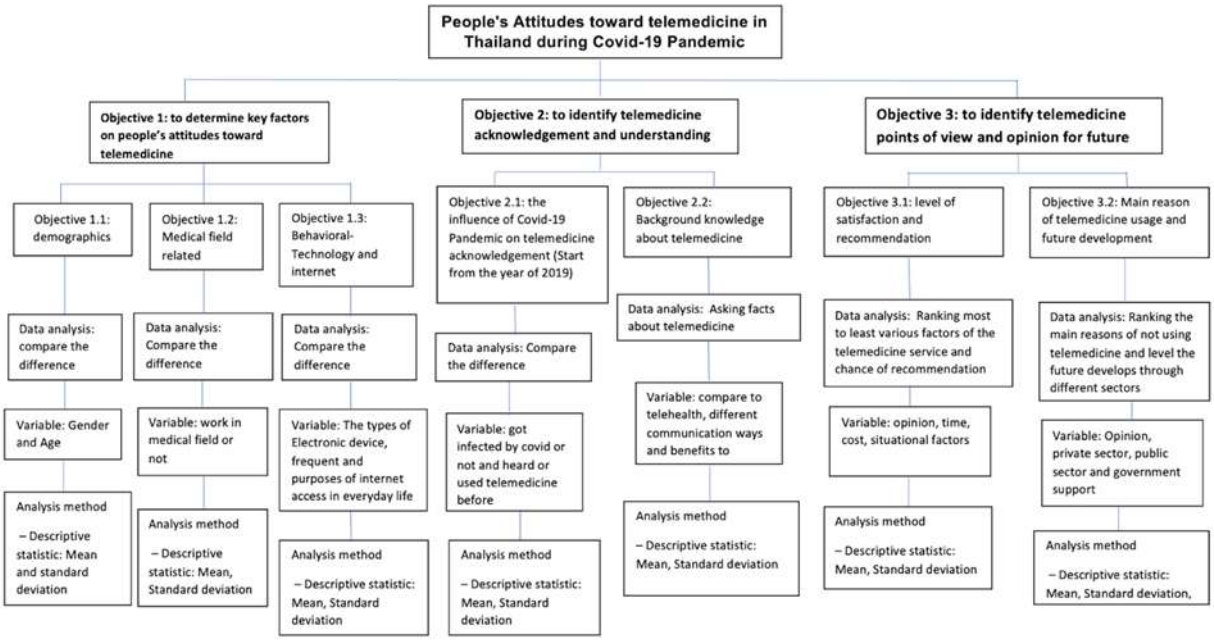
Figure 1 - structure of analysis



Results and Discussion

The difference of common background varied by demographic, familiarity in a health-related or medical field as well as expertise of electronic devices access, including the purpose of internet use is considered to be one factor in the research review to understand why the attitudes and behaviours are perceived and influenced in which directions.

The fundamental data of this research is the online survey received 352 responses in total. Table 2 analyses and summarises the responses in six parts: gender, age range, medical career, daily usage of electronic devices, frequency of internet usage and internet users' objectives.

The study on the awareness and satisfaction assessment in telemedicine services during Covid 19 pandemic in Thailand were gathered mostly by females (67.6%) during the ages of 41-60 years old (n=173,49.1%), significantly 314 respondents out of total 352 not relationship with the study or work in a health-related or medical pathway. Moreover, electronic devices of smartphones present the highest (n=341, 96.9%), compared with only fewer that do not use any device (n=3, 0.9%). The most frequency of the internet usage was in the range of more than 3 hours per day (n=256,72.7%) by using for entertaining (n=333, 94.6%) followed by communication (n=314,89.2%) and work (n=245, 69.6%). (Appendix 1)

Without a doubt, the access of technology becomes common nowadays in all ages from the simple to the complicated for the daily lifestyle of Thai citizens. This provides the possibility of positive outcomes for future growth of telemedicine in Thailand.

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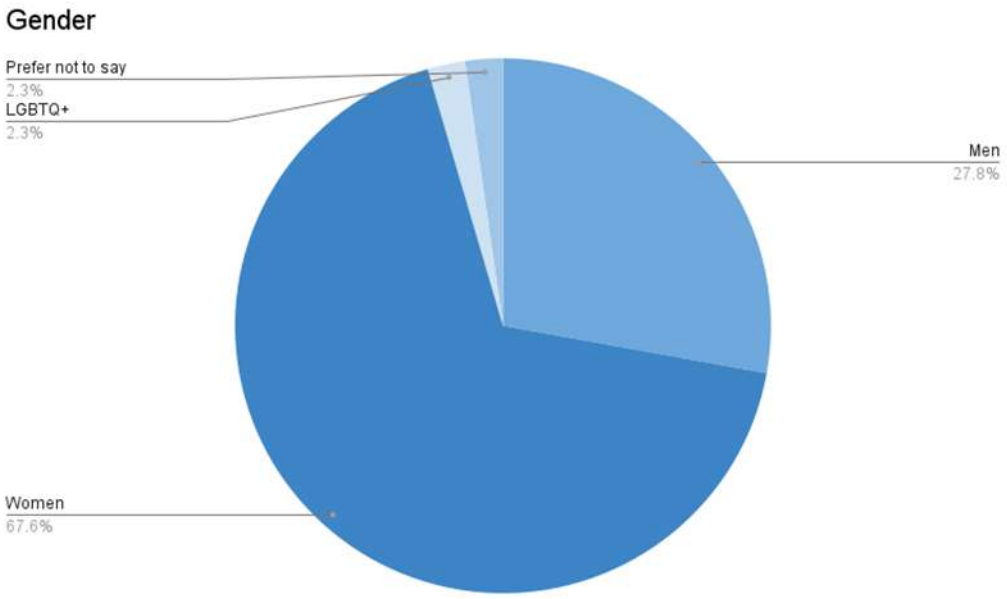
Table 1 - "The respondent's demographics, medical field related and behavioural profile".



Respondent's Profile		n	Percentage
Age range	19 years old or below	87	24.7%
	20 - 40 years old	78	22.2%
	41 - 60 years old	173	49.1%
	61 years old or above	14	4.0%
Medical Career	Yes	38	10.8%
	No	314	89.2%
Daily usage of electronic device	Smartphone / mobile phone / landline telephone	341	96.9%
	Tablet / iPad	224	63.6%
	Notebook / laptop / Macbook	162	46.0%
	Personal computer (PC) / desktop	111	31.5%
	do not use any electronic device	3	0.9%

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Frequency of internet usage	More than 5 times or more than 3 hours per day	256	72.7%
	About 3-5 times or 1-2 hours per day	81	23.0%
	About 1-2 times or less than 1 hour per day	13	3.7%
	Never	2	0.6%
Internet uses	Entertainment (music or movie streaming services)	333	94.6%
	Shopping	145	41.2%
	Communication (instant messaging, social media)	314	89.2%
	Work	245	69.6%
	Others (utility, mobile banking, map)	167	47.4%

Determine key factors on people's attitudes

To get a clear point of view from the study about the influences, it's preferable to determine the principal point on people's attitudes by referring to past experience toward telemedicine services. Table 3 shows the respondents which were divided into two groups: prospective users and non prospective users to describe each research objective's results. The respondents who answered " Yes" were defined as prospective users while the respondents who answered "No" or "Not sure" were defined as non prospective users.

In depth of fractionate study in the questionnaire, the leading group is the non prospective users who are primarily female (153 out of 238 women respondents) and the age ranges at 41-60 years old (n=99, 45.6%). On the other hand, the smallest group of this survey is the prospective users presented only (n=6, 4.4%) for 61 years old or above. The average age range of 20 - 40 years old is (n=33,24.4%) for prospective and (n=46, 21.2%) for non prospective.

From the table, similarly the highest number of prospective and non prospective respondents were both not in the medical field path. This can contribute to the acknowledgement and promote telemedicine in the target group not concerning the healthcare industry to share the viewpoints that differ from people who work in this industry.

The daily usage of electronic devices were still smartphone,tablet,notebook and desktop descending order for both types of users. The most common frequency that people use were at more than or equal to 5 times a day for prospective users and non prospective users. Internet usage where comparing the between two users the order was the same starting with the communication for the highest. (Table 2)

Overall, it may be said that the trend of this research is linked to the non-experience of telemedicine users and the expectation of telemedicine development. Both prospective and non prospective users reported the internet usage and purpose counterbalance results to argue that technology is relevant and corresponding to the topic on this survey.

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Table 2 - Personal key factors related to the decision of using telemedicine

Respondent's Profile		Prospective users (135)	Non Prospective users (217)
		n (%)	n (%)
Gender	Men	43 (31.9%)	55(25.3%)
	Women	85(63.0%)	153(70.5%)
	LGBTQ+	4(3.0%)	4(1.8%)
	Prefer not to say	3(2.2%)	5(2.3%)
Age range	19 years old or below	22(16.3%)	66(30.4%)
	20 - 40 years old	33(24.4%)	46(21.2%)
	41 - 60 years old	74(54.8%)	99(45.6%)
	61 years old or above	6(4.4%)	8(3.7%)
Medical Career	Yes	22(16.3%)	17(7.8%)
	No	98(72.6%)	169(77.9%)
Daily usage of electronic device	Smartphone / mobile phone / landline telephone	115(85.2%)	179(82.5%)
	Tablet / iPad	78(57.8%)	147(67.7%)
	Notebook / laptop / Macbook	69(51.1%)	95(43.8%)
	Personal computer (PC) / desktop	46(34.1%)	66(30.4%)
	do not use any electronic device	0(0.0%)	3(1.4%)
Frequency of	More than 5 times or more than 3 hours per day	95(70.4%)	163(75.1%)
	About 3-5 times or 1-2 hours	33(24.4%)	48(22.1%)

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internet usage	per day		
	About 1-2 times or less than 1 hour per day	7(5.2%)	4(1.8%)
	Never	0(0.0%)	2(0.9%)
Internet uses	Entertainment (music or movie streaming services)	106(78.5%)	191(88.0%)
	Shopping	58(43.0%)	87(40.1%)
	Communication (instant messaging, social media)	118(87.4%)	198(91.2%)
	Work	99(73.3%)	152(70.0%)
	Others (utility, mobile banking, map)	100(74.1%)	152(70.0%)

Telemedicine acknowledgement and experience

In this part, where the test was made to prove whether the period of Covid-19 pandemic, people who were infected by Covid-19 and who were not, has interrelated to the acknowledgement and experience of telemedicine service in particular to the necessity of direct communication on site in restriction. This is the expansion of telemedicine users, increasing the awareness and recognition of online medical services. Table 4 is to support how well people understand or heard of telemedicine before.

From the table, people who got covid had a higher percentage of using telemedicine (n=45, 20.3%) while the same time group of people who were non-infected by covid-19 had a higher percentage who had not used telemedicine. It shows a correlation between telemedicine and Covid-19 infectors. However, from the survey people who heard of telemedicine the most from the statistic, it was Covid 19 non-infector. This can analyse that people who were infected by Covid-19 were slightly less aware of the telemedicine (n=121, 54.5%) than non-infected by Covid-19 (n=81, 62.1%). (Appendix 2)

Sum up the main the infection of covid-19 has accelerated the attention of telemedicine. The perception of people gains the uprising direction when they need to connect with this type of service for the reason that telemedicine is one essentical part of healthcare during Covid-19 pandemic.

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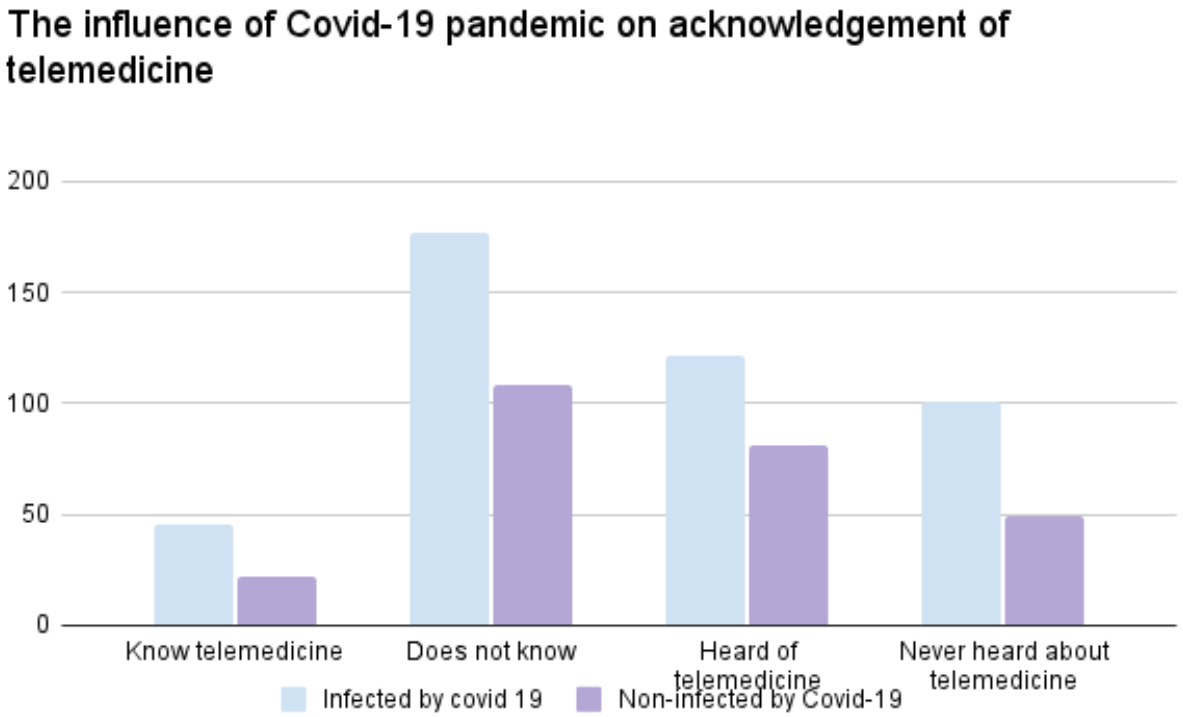
Figure 2 the influence of Covid-19 pandemic on acknowledgement of telemedicine



Whereas the telemedicine services in Thailand are still an upcoming process and the barriers of face to face communication invoke a great opportunity. However this study is to evidence how effectively and rightly the terminology of telemedicine is observed which mostly have some overlap with telehealth and telecare. Also the most common question, what telemedicine is.

From the study it mentioned that the majority of people tend to think that telemedicine and telehealth are the same thing (n=229) while the minority think oppositely (n=123). To extend on that people were all agree that telemedicine is the mode of telephone or mobile voice calling to the physicians (n=328), followed by the way of video calling like face to face (n=265), live or real-time chat (n=193), photo and text messages (n=146), software or application (n=134) and lastly email (n=70).

In brief, what people's opinion on telemedicine benefits to whom is to find out the mindset and the reflection about telemedicine. The mass of respondents understand

"What is telemedicine" and telehealth mean the same thing, and being the alternative option instead of visiting the doctors personally at hospital is acceptable because the highest figures of this answer is replied to the patient who benefits in their point of view (n-117).

Table- 3.2 The background knowledge on telemedicine related to the respondents' profile

Knowledge statistic		**n**
Do you think that telemedicine is the same thing as telehealth ?	Yes	229
	No	123
Through what mode(s) of communication can telemedicine be accomplished in	Telephone or mobile	328

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your understanding? (You may select more than one option.)	voice calling	
	Video calling (face-to-face)	265
	Photo and text messages	146
	Live or real-time chat	193
	Email	70
	Software or application	134
Whom do you think telemedicine benefits? (You may select more than one option.)	Patient	117
	Doctor	95
	Hospital	88
	Insurance Company	46

Telemedicine point of view and opinion for future

This part of the study was to identify the people's perspective and opinion for telemedicine in the future by dividing it into 4 sub parts. First part was to discover the level of satisfaction from the telemedicine user (Table 4.1). Second part was to find out the number of respondents on the recommendation of telemedicine from the telemedicine users (Table 4.2). Third is to identify the main reasons from 3 different areas to see reasons for choosing to use telemedicine (Table 5.1). Last but not least, the fourth part was to identify the improvement that could be made with telemedicine which could lead to a better improvement and motivation on telemedicine in the future (Table 5.2).

According to table 5.1, overall the approximately satisfaction from the telemedicine user is around the stage of satisfied (4) with the mean of around 4. There were 8 factors in total for this questionnaire. For consultation with the doctor and appreciation nurse service was 40 extremely satisfied people (29.6%) and showed 1 extremely dissatisfied person (0.7%). Value of money is quite satisfied (34.8%), and offers better cost than the standard price. For the worth of time management, extremely satisfied was 69 people (51.1%), satisfied was 42 people (31.1%), neural was 18 people (13.3%), dissatisfied was 5 people (3.7%) and extremely dissatisfied was 1 person (0.7%) respectively.

To respond to the quality of telemedicine , 59 people felt satisfied with the result of the treatments and the negative attitude showed very little, presenting 4 people of dissatisfaction (3.0%) and only 1 person of extreme dissatisfaction (0.7%).

In parts of privacy and internet access, it can be said that most didn't feel worried. The limitations of communication via online systems presented high satisfied results - 44 people (32.6%). So from this study it can be seen that it's not difficult to give personal information and to use telemedicine internet connectivity, however the areas of respondent living

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influence the access which may need more further study in the topic of specific details. This is one of the various factors for this survey. (Table 5.1)

Table 4.1- Level of satisfaction on various factors from telemedicine users

Factors affect the satisfaction of the telemedicine users		n (%)	Mean	S.D.
Consultation with doctor	Extremely dissatisfied (1)	1(0.7%)	4	0.86
	Dissatisfied (2)	6(4.4%)		
	Neutral (3)	27(20.0%)		
	Satisfied (4)	61(45.2%)		
	Extremely satisfied (5)	40(29.6%)		
Nurse service	Extremely dissatisfied (1)	1 (0.7%)	4	0.88
	Dissatisfied (2)	5(3.7%)		
	Neutral (3)	35 (25.9%)		
	Satisfied (4)	54(40.0%)		
	Extremely satisfied (5)	40(29.6%)		
Worth of money	Extremely dissatisfied (1)	2(1.5%)	3.8	0.94
	Dissatisfied (2)	6(4.4)		
	Neutral (3)	42(31.1%)		
	Satisfied (4)	47(34.8%)		
	Extremely satisfied (5)	38(28.1%)		
Time management	Extremely dissatisfied (1)	1(0.7%)	4.3	0.89
	Dissatisfied (2)	5(3.7%)		
	Neutral (3)	18(13.3%)		

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	Satisfied (4)	42(31.1%)		
	Extremely satisfied (5)	69(51.1%)		
Result of the treatment	Extremely dissatisfied (1)	2(1.5%)	4	0.91
	Dissatisfied (2)	5(3.7%)		
	Neutral (3)	27(20%)		
	Satisfied (4)	59(43.7%)		
	Extremely satisfied (5)	42(31.1%)		
Privacy of personal information	Extremely dissatisfied (1)	1(0.7%)	4	0.88
	Dissatisfied (2)	4(3.0%)		
	Neutral (3)	32(23.7%)		
	Satisfied (4)	52(38.5%)		
	Extremely satisfied (5)	46(34.0%)		
Communication/ internet access	Extremely dissatisfied (1)	2(1.5%)	4.1	0.93
	Dissatisfied (2)	3(2.2%)		
	Neutral (3)	31(23.0%)		
	Satisfied (4)	44(32.6%)		
	Extremely satisfied (5)	55(40.7)		
Ease of convenience in process	Extremely dissatisfied (1)	3(2.2%)	4.1	0.96
	Dissatisfied (2)	6(4.4%)		
	Neutral (3)	20(14.8%)		
	Satisfied (4)	53(39.3%)		
	Extremely satisfied (5)	53(39.3%)		

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From the survey, over the whole number of 135 who have an experience using telemedicine, 124 people of all or 91.9% would recommend it to other people while 11 people or 8.1% of the population would not want to recommend it. (Table 5.2)

Table 4.2- Number of respondents on the recommendation of telemedicine

Recommended	n	Percentage
Yes	124	91.9%
No	11	8.1%

From this table, it showed the main reasons for choosing to use telemedicine. The most common reason was that "home isolation was the only option available due to no hospital rooms being available" (n=68) while the lowest were others and "I trusted it and decided on my own to use it" (n=3 and n=32). Following with the most devices that were used for the telemedicine service was smartphone (n=121), then tablet (n=46), notebook (n=32), personal computer (n=11) and not using any electronic devices(n=2). The best platform to access telemedicine was hospital website/ mobile application with 91 people, running up was government sector mobile application with 50 people, then private sector mobile application with 36 and lastly the insurance website/mobile application with 30 people. (Table 5.1)

Table 5.1- Main reasons on using telemedicine

Main Reasons		**n**
Why did you decide to use telemedicine when infected with Covid-19?	I was recommended by a hospital, insurance company or family/friends to try it.	56
	It was the process of treatment or the regulation by the Hospitel I stayed at.	55
	Home isolation was the only option available due to no hospital rooms being available.	68
	I trusted it and decided on my own to use it.	32
	Other	3
Which electronic device(s) did you use for the telemedicine service?	Smartphone / mobile phone / landline telephone	121
	Tablet / iPad	46
	Notebook / laptop	32
	Personal computer (PC) / desktop	11

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	I did not use any electronic devices	2
Which platform did you use to access telemedicine?	Hospital website / mobile application	91
	Insurance website / mobile application	30
	Government sector mobile applications such as Good Doctor Technology, MorDee, Clicknic	50
	Private sector mobile applications such as Raksa, Doctor A-Z, See Doctor Now	36
	Other	7

From the Table 6.2, the responders all agree that the reason that they decided not to use telemedicine was because they did not know about the telemedicine before (n=124, 57.1%), followed by felt worried about the safety of the telemedicine system (n=51, 23.5%) similar to other factors (n=49, 22.6%). To develop telemedicine by promoting the result shows 119 people (54.8%, m= 4.3, S.D.=0.88) strongly agree and 52 people (24.0%, m= 4.3, S.D. =0.88)agree to have Thailand promote telemedicine with the running up question it showed that the best way to promote was that telemedicine should be supported by the government (n=133, 61.3%, M=4.4, S.D.= 0.93) and almost the same number of people said that telemedicine should be developed by the private sector(n=114 ,52.5%, M=4.2, S.D.=0.92). (Table 5.2)

Table 5.2- Promoted and motivated for future development of healthcare organisations in Thailand

Respondent's Opinion		**n (%)**	**Mean**	**S.D.**
Why did you decide not to use or were not sure about using telemedicine when you were infected with Covid-19?	Didn't know about telemedicine before	124(57.1%)		
	Problem with the internet access	10(4.6%)		
	Lack of an electronic device to use it with	4 (1.8%)		
	Didn't understand it or felt that the process of telemedicine is too complicated	47(21.7%)		
	Felt worried about the safety of the telemedicine system	51(23.5%)		
	High cost of treatment	10(4.6%)		
	Other	49(22.6%)		

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"Telemedicine should be promoted more in Thailand."	Strongly disagree (1)	2(0.9%)	4.3	0.88
	Disagree (2)	2(0.9%)		
	Neutral (3)	42(19.4%)		
	Agree (4)	52(24.0%)		
	Strongly agree (5)	119(54.8%)		
"Telemedicine should be supported by the government sector"	Strongly disagree (1)	3(1.4%)	4.4	0.93
	Disagree (2)	5(2.3%)		
	Neutral (3)	36(16.6%)		
	Agree (4)	40(18.4%)		
	Strongly agree (5)	133(61.3%)		
"Telemedicine should be developed by the private sector"	Strongly disagree (1)	4(1.8%)	4.2	0.98
	Disagree (2)	4(1.8%)		
	Neutral (3)	49(22.6%)		
	Agree (4)	46(21.2%)		
	Strongly agree (5)	114(52.5%)		
Did you find any difficulty or problem in the process of telemedicine?	Yes	15(11.1%)		
	No	120(88.9%)		

Limitations

Clearly, this research is based on Thai context, we thus accept that its external validity cannot be ensured. Consequently, the finding might not be readily generalisable beyond this study. To ensure the generalisation, further research should be conducted by requiring other demographic factors and geographical contexts. Moreover, due to the time constraint, the sampling plan, data collection, and data analysis may not represent the whole population, as this study used convenience sampling and therefore the female respondents in this survey were underrepresented in data collection due to the survey's bias distribution.

Recommendation

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According to the poll, the majority of the potential customers were female and between the ages of 41 and 60. The suppliers of telemedicine services should improve the usability, dependability, advertising, and accessibility of their services. From the perspective of the potential patient, Thailand should be marketing telemedicine services; as a result, the public and private sectors should be urged to promote telemedicine development and advertising. To help with the cost-cutting and to encourage patients to use telemedicine for a long time, cooperation between the government and insurance providers may be formed. The services should investigate and conduct additional study on the reasons why non-prospective users do not desire to utilise telemedicine.

Conclusion

In conclusion, this study examined key factors, acknowledgment, understanding and opinion toward telemedicine with a total of 352 respondents. Our findings showed and supported that concerns need to be raised regarding patient trust and, more crucially, patient awareness of telemedicine. For future practises in Thailand during and after COVID-19, preparation, education, and the development of a clear framework for telemedicine may be required.

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