Perspectives and Confidence of Medical Students toward Telemedicine in Disruptive Era

Nattapong Hongsimakul[1], Naruporn Krungkraipetch[1], Kanyakorn Siraprapapong[1], Thawanporn Chukiatchaturaporn[1], Sakarn Charoensakulchai, M.D.[2,3]

[1]Medical Cadet, Phramongkutklao College of Medicine, Bangkok 10400, Thailand

[2]Department of Parasitology, Phramongkutklao College of Medicine, Bangkok 10400, Thailand

[3]Medical Education Unit, Phramongkutklao College of Medicine, Bangkok 10400, Thailand

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Abstract:

Background: COVID-19 pandemic disrupts the current form of patient care such as lock down and fear of disease at hospital. Convenience and modern care of patient emerged such as telemedicine and Metaverse. Preparation medical students for modern care is important. This research assesses the perspectives and confidence of medical students in Telemedicine.

Methods: This study focused on medical cadets of Phramongkutklao College of Medicine. The questionnaire of this study is quantitative data included three parts: general characteristics, perspectives and confidence toward telemedicine. Data were collected by using a five-point Likert-scale in an electronic standardized questionnaire edited in Google platform covering perspectives toward telemedicine (case management, medical teaching, patient convenience, physical convenience) and confidence toward telemedicine (history taking, physical exam, case management, case evaluation). One-way ANOVA was used to compare all perspectives and confidence with independent t-test for comparing perspectives and confidence between groups. Data were analysed using SPSS 26.0.

Results: Ninety-four students enrolled. Most of them were in pre-clinical year (73.4%). There was significant different in perspectives toward telemedicine ($F = 4.05$, $p = 0.008$). Perspectives toward case management was lower than use of telemedicine for medical teaching (Mean difference = 0.33, $p = 0.013$) and patient convenience (Mean difference = 0.29, $p = 0.033$). Regarding confidence, there was no significant difference in all aspects of case management. All aspect of confidence had generally low mean score.

Conclusion: The perspective of medical students toward the telemedicine is positive attitude except for case management. However, the confident for using telemedicine is rather low as a cause of medical school not prepare or practice medical students for using telemedicine. As a result, medical school is still lack of adaptation for disruptive era as it should be.

Keywords: Telemedicine, Medical students, Perspectives, Confidence

Corresponding author: Sakarn Charoensakulchai, M.D.
Medical Education Unit, Phramongkutklao College of Medicine,
317/5 Rajavithi Road, Ratchathewi District, Bangkok 10400, Thailand
E-mail: Karn.skch@gmail.com

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Introduction

Presently, access to adequate medical care is still a major problem worldwide especially in those developing countries. Thailand has also faced this problem with equality of health workforce distribution. The health workforce has been density in the central region which contributes to disparities in health outcomes especially in rural area.[1]

COVID-19 pandemic has caused significant impact on the accessibility of resources in the healthcare centres, lockdown measurements, physical distancing and limited traveling. Telemedicine is the key to provide equal access of healthcare to the users and minimizing the risk of COVID-19 infection and contributes positively to the realisation of the right to health and the attainment of the United Nations Universal Health Coverage (UHC) Agenda under the Sustainable Development Goals (SDGs) which specifically aims to improve access to health care services for all by ensuring that people can receive health care services whenever the need arises.[2]

However, the use of telemedicine technology is affected by many factors. Human related factors such as physicians' knowledge and their perspective towards the technology are essential factors to be considered before initiating the system.[3,4] A lack of accurate knowledge and necessary skills such as technical expertise among physicians remains a barrier to the efficient use of telemedicine.[5]

The objective of this study was to explore perspectives and confidence toward telemedicine of medical students from Phramongkutklao College of Medicine (PCM) since the preparedness is the key to the success in implementing telemedicine in developing countries.

Materials and Methods

Study population and setting

This study focused on medical students of Phramongkutklao College of Medicine (PCM). The potential participants included medical cadets in pre-clinical years and another in clinical years. The study was conducted during 2021.

Study design

This study used cross-sectional study. This included perspective and confidence toward telemedicine of medical cadet students in PCM.

Questionnaire and data collection

The questionnaire of this study used quantitative data included three parts; general characteristics (gender, year, age and GPAX) perspectives and confidence toward telemedicine which was 5-Likert scale. The perspectives toward telemedicine included 4 aspects: 1) case management: develop healthcare promotion/primary prevention (CM), 2) medical teaching: tele-education (MT), 3) patient convenience (PaC) and 4) physical convenience (PhC). The confidence toward telemedicine included 4 aspects 1) history taking (HT), 2) physical exam (PE), 3) case management (MC) and 4) case evaluation (CE).

The questionnaire was made online on Google form and distributed via messaging applications to participants. Responses from participants were stored on Google sheet which could be downloaded for statistical analysis.

Statistical analysis

SPSS 26.0 (Armonk, New York) was used for statistical analysis. General characteristics were calculated using descriptive statistics. Comparison between perspectives was conducted using one-way ANOVA with post-hoc tests by Bonferroni test. Comparison between internship years and genders were assessed using independent t-test. Significant differences between comparisons were counted at p-value < 0.05.

Results

A total of 94 students responded to the questionnaire. From these, 73.40% were in pre-clinical year. There were 52.13% males and 47.87% females. Most students (57.45%) had GPAX of 3.50 to 4.00, followed by 3.01-3.49 (32.98%). Demographic data were displayed in Table 1.

Table 1 Demographic data of participants

Characteristics	N (%)
Gender	
Male	49 (52.13)
Female	45 (47.87)
Year	
Pre-clinic	69 (73.40)
Clinic	25 (26.60)
GPAX	
2.99 and below	9 (9.57)
3.00-3.49	31 (32.98)
3.50 and above	54 (57.45)

Perspectives toward telemedicine

There was significant difference in perspectives toward telemedicine ($F = 4.05$, $p = 0.008$). Mean score of patient convenience, physician convenience, medical teaching and case management were 3.99 ± 0.68, 3.84 ± 0.73, 4.02 ± 0.79 and 3.70 ± 0.68, respectively. Perspectives toward case management was lower than use of telemedicine for medical teaching (Mean difference $= 0.33$, $p = 0.013$) and patient convenience (Mean difference $= 0.29$, $p = 0.033$). The data were shown in Table 2.

Table 2 Comparison of perspectives of participants toward telemedicine

Mean score				One-way ANOVA				Pair comparison		
PaC	PhC	MT	CM	Leveve's statistic	*p*	F	*p*	Pair comparison	Mean difference	*p*
3.99	3.84	4.02	3.70	15.32	<0.0001	4.05	0.008	CM<PhC	0.15	1.000
±0.68	±0.73	±0.79	±0.68					CM<PaC	0.29	0.033
								CM<MT	0.33	0.013
								PhC<PaC	0.15	0.953
								PhC<MT	0.18	0.524
								PaC<MT	0.03	1.000

Confidence toward telemedicine

It was found that there was not different in confidence in telemedicine among medical students ($F = 2.35, p = 0.072$). Mean score of history taking, physical examination, case evaluation and case management were 3.05 ± 0.88, 2.88 ± 0.85, 2.93 ± 0.86 and 3.18 ± 0.78, respectively. The data were shown in Table 3.

Discussion

This study addressed the perspectives and confidence toward telemedicine of medical student. These two parameters are important indicators for assessing readiness of medical students for future era of health care.

It was found that medical students at PCM viewed telemedicine positively, except for case management. On the contrary, they still lacked confidence in using telemedicine for clinical practice. It can be implied that younger physicians and medical students acknowledged telemedicine as an alternative, or even revolutionary, trend of healthcare, however, due to drastic change in health care delivery amidst COVID-19 pandemic, knowledge and familiarity for telemedicine among them were not well prepared, resulting in low confidence. These findings were parallel to previous study in France where medical students stated that most medical students were not familiar and not well-trained for telemedicine. A study in China indicated that most medical professions and medical students were familiar with the concept of a "virtual visit", but only a few ever engaged in such visits. A previous study in Sri Lanka stated that even though medical students were familiar with e-health concept, there was an extremely limited practice in this field. As a result, this might reflect the positive attitudes toward telemedicine, but low in confidence and engagement to this type of healthcare.

Table 3 Comparison of confidence of participants toward telemedicine

Mean score				One-way ANOVA				Pair comparison		
HT	PE	CE	MC	Leveve's statistic	*p*	F	*p*	Pair comparison	Mean difference	*p*
3.05	2.88	2.93	3.18	18.91	<0.001	2.35	0.072	PE<CE	0.05	1.000
±0.88	±0.85	±0.86	±0.78					PE<HT	0.17	1.000
								PE<MC	0.30	0.096
								CE<HT	0.12	1.000
								CE<MC	0.25	0.258
								HT<MC	0.13	1.000

This study found that perspectives of medical students toward case management were significantly lower than other aspects of perspectives. This concern could be centered around the quality of healthcare when physical meeting between physicians and patients was omitted. The scope and extent of telemedicine used among physicians, especially specialists who required thorough physical examination was still obscure. Physicians also believed that only objective data could be truly consulted from the distance, whereas relying on remote interpretation of subjective data was inappropriate. To counter this problem, education and training medical students to utilize telemedicine would improve their

understanding and encourage the use of telemedicine, as well as better perceived advantages of telemedicine.

Telemedicine is the state of the art. Medical students should be trained in several aspects, for instance, how to communicate with the patients through video- or voice-call, how to led the patients explain their health problems in distance as similar to physical meetings, how to use instruments, such as phone camera, camera flashlight and messaging applications, to perform basic physical examination, how to give diagnosis with distance and thorough physical examinations and to know the extent of using telemedicine consultation without doing harm to patients.

Further studies should focus on training of the mentioned aspects for medical students. Another study field should explore knowledge, attitude and confidence as well as problems of telemedicine encountered in real practice among intern physicians who had completed the telemedicine training.

Conclusion

Telemedicine is revolutionary trend in health care system. Medical students perceived it with good attitudes, however, confidence is still low in using telemedicine among them. To increase their familiarity and confidence in using telemedicine, training and education to medical students are crucial.

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Disclosure of interest

The authors report no conflict of interest.

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