
Perception on Telemedicine by Physicians as Mode of Consultation During COVID-19 Pandemic*

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ABSTRACT

Background: As the world started facing the pandemic brought by COVID-19, different innovations were implemented to continuously provide and deliver healthcare services to the Filipino people. Telemedicine allows patients to seek consultation for medical problems without the risk of exposure that comes with leaving the house to visit the doctor. This study aims to establish physician perception on the use of Telemedicine as an alternative mode of consultation during the COVID-19 pandemic.

Methods: Descriptive, purposive, cross-sectional study was conducted. Respondents were physicians from public or private institutions in Luzon. A survey questionnaire was sent through email and social media platforms, consent were secured and responses were collated.

Results: A total of 69 physicians participated. Results showed that most of the respondents started using telemedicine only after the pandemic started. Majority were from the National Capital Region (NCR) and affiliated with a private clinic. The ages ranged from 31-40 and 51-60 years old. Social networking sites, such as Facebook Messenger, and Viber, were the most commonly utilized telemedicine platform. Participants perceived the use of telemedicine as easy to use and navigate (n=65) and appropriate during this pandemic (n=68). With regards to cost-effectiveness, most of the participants perceived telemedicine as cost-effective in terms of fees for services and expenses. Advantages that were perceived were provision of access to remote or rural patients (n=61) and improved patient convenience (n=63). While challenges that were perceived were the technological problems (n=69), limitations in assessing the patient's condition (n=68), and there were security risks in terms of the patient's medical information (n=68).

Conclusion: Majority of the physician-respondents were private practitioners from NCR. Most perceived the use of telemedicine as easy and cost-effective during the pandemic. Telemedicine also provided access to medical care in remote areas, aside from the safety and convenience provided as consultations were done in the protected confines of the home. However, there were also perceived downsides to the use of telemedicine — particularly, internet connectivity problems and the possible security risks of patient's medical information.

Key words: Telemedicine, physicians, COVID-19, perception

As the world started facing the pandemic brought by COVID-19, different innovations were implemented to continuously provide and deliver

healthcare services to the Filipino people. Currently, in the Philippines, the Department of Health (DOH) issued a Joint Memorandum Circular No. 2020-0001, stating the guidelines on the use of telemedicine as part of the COVID-19 response. This enabled the patients to receive health services while keeping them safe at home, except in cases with serious conditions, emergencies, or COVID-19 related medical problems.¹ Very few were familiar with

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Telemedicine, however, out of necessity, it is now promoted and highly utilized. Telemedicine covers the preventive, promotive, curative, and palliative aspects of healthcare, normally done face-to-face, but with the call of the times, now acceptably done virtually, a welcome solution to continuing medical care without patients having to travel outside or to go to a hospital—the goal being to effectively minimize unnecessary exposure and prevent the spread of the dreaded COVID-19.

The method of delivering telemedicine varies, ranging from the use of mobile devices (mHealth), telephone, instant messaging, and synchronous and asynchronous exchange of pictures and videos. As the country transitioned to this approach of health care, both physicians and patients had to learn and adapt to this method. Studies, written prior to and during the COVID pandemic have been published illustrating different perceptions in the use of telemedicine for patient consultations. Haimi, et al. (2018) described the challenges of telemedicine services which included: difficulties of diagnosing from a distance, treating unfamiliar patients, working alone, urgency and load of calls, technological obstacles, and a “moral conflict” between the desire to meet patients’ expectations and maintain standards of care. At the same time, physicians also face different difficulties and challenges requiring special expertise. Another study, discussed the perceived ease of use and perceived usefulness of telemedicine and how it can influence physicians’ behavioral intentions that subsequently can result in increased quality of services, quality patient care delivery, and satisfaction in using telemedicine services. While a study by Dea Indria, et al.³, showed that clinicians in Indonesia were satisfied with the telemedicine system with the only identified problem being internet connectivity. Here in the Philippines, even though there were initiatives such as a medical hotline by the DOH, studies showed that data regarding the effectiveness, challenges, and satisfaction of physicians on telemedicine were still lacking and inconclusive.

This study aimed to determine the perception of physicians regarding telemedicine as a mode of consultation in terms of usage, cost-effectiveness, advantages, and challenges during the COVID-19 pandemic. Establishing the perceptions of physicians who were currently using telemedicine will identify the current gaps in telemedicine use in the country and subsequently instigate needed recommendations to address the challenges and maximize the use of

telemedicine as advocated by the Department of Health, during this pandemic.

MATERIALS AND METHODS

This is a descriptive, cross-sectional study which included eligible participants who were Filipino, licensed physicians, in public or private practice and use telemedicine as a mode of consultation. Physicians who practice outside of Luzon were excluded. This research was reviewed and approved by the FEU-NRMF Institutional Ethics Review Committee and was conducted electronically via the internet.

Study Procedure

Non-probability purposive sampling methodology was used. Participants that met the inclusion criteria were included: Filipino, licensed physicians working in a public and/or private hospital in Luzon. Using purposive sampling, respondents were identified through sending letters of request to different hospitals known to have Telemedicine, through recommendations/referrals, and via web search of medical practitioners with advertisements/published telemedicine practice.

Letters of intent were sent through electronic mail to the medical director, head/chief of clinics, and chairman of different departments of chosen government and private hospitals such as FEU-NRMF Medical Center, Veterans Memorial Medical Center, and others, which enabled the researchers to come up with an initial shortlist of telemedicine users during the COVID-19 pandemic. From the initial list, the researchers also asked for referrals of other telemedicine users who also fit the inclusion criteria and can participate in the study. This was done until the desired sample size was met. Referrals from acquaintances and friends in public and/or private practice who are willing to participate in the study were also sought. Additional sources of participants were through a web search of medical practitioners with advertised/published practice of Telemedicine and from different medical institutions with established use of Telemedicine.

The researchers contacted all the identified physicians through electronic mail or social networking sites. Upon contact, a consent form was sent along with the survey questionnaire using Google Forms that were distributed via electronic mail and/or other messaging platforms from April 5 to April 16, 2021.

Data collection was web-based using Google Forms as the platform for the 10- item electronic questionnaire. The distribution of this electronic questionnaire was also web-based via electronic mail, and/or through social media messaging platforms which were Messenger, Viber, and Telegram. All responses were automatically viewed as soon as the Google Forms were completed and submitted. These were then compiled in a Google drive which was only accessible to the researchers.

Physician demographics such as sex, age, location of practice, specialization, duration of telemedicine use, telemedicine modality used, and the physicians' perception who uses telemedicine as a platform for patient consultation. For the perception on the use of telemedicine, the researchers asked the participants' perception in terms of usage, cost-effectiveness, advantages, and challenges of telemedicine as a mode of consultation during the new norm.

Research Instrument

To determine how physicians view this new system of medical consultation, a 10- item questionnaire was used to evaluate the physicians' perceptions on usage (items 1- 7), cost-effectiveness (item 8), advantages (item 9), and challenges (item 10) of using telemedicine. The items in this questionnaire were formulated by the researchers based on the study of Chau & Hu (2002) and were modified to suit the current study and population.

Pilot testing with 19 respondents was done to check for ease of answering and comprehension. A prototype Google Form was made, and feedback and comments were collected. Corresponding changes were made for improvement of the questionnaire.

The perceived usage, cost-effectiveness, advantages, and challenges of telemedicine were listed and measured by the frequency of the statements selected, with perception referring to the acceptability and ideas of the physician while using its different methods.

Each statement in every variable, was treated as an independent item of agreement or disagreement from the participant. If the statement gained 60% agreement from the participants (42 participants) it can be categorized as a significant and applicable statement to the population.

Sample Size, Data Management, Encoding and Analysis

Using the population proportion, based on a previous study conducted by Indria, et al. (2020), with 76.9% proportion, assuming that with 95% reliability, the maximum allowable error will be ± 10 units from the true value. The sample size for this study was 69.

This study utilized Google Forms as a mode of conducting survey and Microsoft Excel as data analyzer. The answers from the Google Forms were generated and compiled in Google Sheets.

RESULTS

The data gathered determined the perception of 69 selected physicians towards telemedicine as a mode of consultation in terms of usage, cost-effectiveness, advantages, and challenges during the COVID-19 pandemic.

Demographics

The demographic profile of the respondents revealed that most of the physicians started using telemedicine only during the COVID-19 pandemic. Most practice within NCR (National Capital Region), and majority of the respondents were female and aged 31-40 and 51-60 as seen in Figure 1. The respondents were from various fields of practice, majority were from the field of Pediatrics, followed by Family Medicine, and the minority were from the field of Dermatology, General Medicine, and Internal Medicine. Most respondents were affiliated with a private clinic telemedicine service as seen in Table 1.

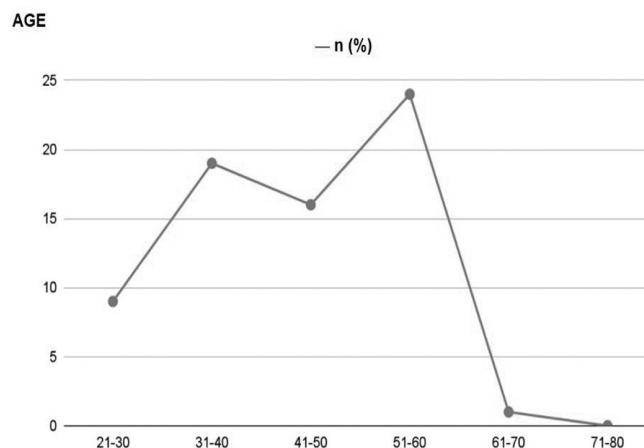


Figure 1. Age ranges of physicians who participated in the study.

Table 1. Demographic profile.

Demographics	N (%)
Sex:	
• Female	44 (63.8)
• Male	25 (36.2)
Specialization:	
• Pediatrics	12 (17.4)
• Family Medicine	10 (14.5)
• Dermatology	8 (11.6)
• General Medicine	8 (11.6)
• Internal Medicine	8 (11.6)
• Others*	24 (33.3)
Area of Practice:	
• NCR (National Capital Region)	50 (72.5)
• CALABARZON (Region IVA)	12 (17.4)
• Cagayan Valley (Region II)	9 (13.0)
• Ilocos Region (Region I)	5 (7.2)
• Others**	8 (8.6)
Telemedicine use:	
• Only during the pandemic	61 (88.4)
• Prior to the pandemic	8 (11.6)
Affiliation:	
___ Private Clinic	38 (55.1)
___ Under Institution	12 (17.4)
If yes,	
___ Public hospital	17 (54.8)
___ Private hospital	12 (38.7)
___ Both	19 (27.5)

*OB-GYN, Surgery, ENT-HNS, Ophthalmology, Pathology, Psychiatry, Urology, Anesthesiology, Emergency Medicine, Occupational Medicine, Orthopedics, Plastic Surgery, Radiology

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Among the various telemedicine modalities available to physicians, the platforms that were most frequently utilized were social networking sites (SNS), such as Facebook Messenger, Viber and Telegram followed by phone calls. Among the respondents who utilized telemedicine platforms, the majority utilized free telemedicine platforms as seen in Table 2.

Usage and Cost-Effectiveness

Results showed in Table 3, that in terms of usage and cost-effectiveness, almost all of the respondents agreed in the statement that telemedicine is easy to use and navigate and is appropriate given the current COVID pandemic. On the other hand, more than half of the respondents disagreed that telemedicine is time-consuming and increases workload.

Table 2. Telemedicine modalities used by the physicians.

Telemedicine Modalities	N (%)
Social Network Service (e.g. Facebook Messenger, Viber, WhatsApp, etc.)	66 (95.7)
Phone Call	39 (56.5)
Short Message Service (SMS)/ Text Messaging	37 (53.6)
Telemedicine Platforms (e.g. Medifi, SeriousMD, Doxy.me, PPD, MedCheck, etc.)	29 (42.0)
If telemedicine platform is/are used,	22 (75.9)
Free	7 (24.1)
Paid	

*Participants selected all that applied.

With respect to cost-effectiveness of telemedicine, almost all believed that the costs of telemedicine are reasonable in terms of fees for services received and expenses in its use.

Advantages

Regarding the perceived advantages in the use of telemedicine, as seen in Table 4, the majority agreed that telemedicine can provide access to remote and rural areas and that telemedicine can improve patient convenience. On the other hand, more than half of the respondents disagreed that telemedicine can improve specialist efficiency and can give diagnosis and treatment faster.

Challenges

The participant's perceived disadvantages are shown in Table 5. All of the respondents agreed that technological problems is one disadvantage of telemedicine. In telemedicine, limited assessment about the patient's condition poses a challenge and is deemed a disadvantage for every participant. However, majority of the participants disagreed that telemedicine increases expenditure.

Most of the results showed that almost all of the statements were significant or reached 60% agreement from the participants except for the following statements: in terms of the usage, telemedicine can provide significant results in patient diagnoses; in terms of advantages, telemedicine increases patient engagement and satisfaction, and improves skill and

Table 3. Usage and cost-effectiveness in the use of telemedicine as mode of consultation			
Usage and Cost-Effectiveness	Agree	N (%)	Disagree
The use of telemedicine technology is appropriate given the current COVID pandemic	68 (98.6)		1 (1.4)
Telemedicine is easy to use and navigate	65 (94.2)		4 (5.8)
The cost of telemedicine is reasonable in terms of fees for services received and expenses in telemedicine use (savings from travel expenses, bills from utilities and application use)	62 (89.9)		7 (10.1)
Telemedicine is still useful even when face to face/ physical consultation is already allowed	55 (79.7)		14 (20.3)
The use of telemedicine makes patient care more manageable during the pandemic	54 (78.3)		15 (21.7)
Telemedicine can provide significant results in patient diagnoses	38 (55.1)		31 (44.9)
Telemedicine is time-consuming	26 (37.7)		43 (62.3)
Telemedicine increases work-load	25 (36.2)		44 (63.8)

Table 4. Advantages in the use of telemedicine as mode of consultation			
Advantages	Agree	N (%)	Disagree
Improves patient convenience	63 (91.3)		6 (8.7)
Provides access to remote or rural patients	61 (88.4)		8 (11.6)
Increases patient engagement and satisfaction	39 (56.5)		30 (43.5)
Provides 24/7 access to specialists	32 (46.4)		37 (53.6)
Improves skill and coordination towards patients	28 (40.6)		41 (59.4)
Improves specialist efficiency	26 (37.7)		43 (62.3)
Diagnosis and treatment faster	18 (26.1)		51 (73.9)
Others			

Table 5. Challenges in the use of telemedicine as mode of consultation			
Challenges	Agree	N (%)	Disagree
Technological problems (e.g. Slow internet connection, unfamiliar use of gadgets)	69 (100)		0 (0)
Limited assessment about patient's condition	68 (98.6)		1 (1.4)
Security risk in physician and patient information	59 (85.5)		10 (14.5)
Limited funding	42 (60.9)		27 (39.1)
Does not build a good doctor-patient relationship	35 (50.7)		34 (49.3)
Increases expenditure	15 (21.7)		54 (78.3)

coordination of the physician towards their patient; in terms of challenges, telemedicine increases patient engagement and satisfaction and good doctor-patient relationship is not established when using telemedicine. These statements yielded varied responses from the participants.

There were also statements that more than 60% of the participants disagree. These statements were: in terms of advantages, telemedicine improved specialist efficiency and provided faster diagnosis and treatment; while an increase in expenditure when using telemedicine was not perceived as a disadvantage.

DISCUSSION

This study was tailored to have an understanding of physicians' perception of the telemedicine modality - especially in light of the pandemic and how relevance of this method was perceived during this time. The overall result of the study suggested that although telemedicine was not classified as convenient as physical consultations, it has proven itself satisfactory in providing at least an initial step in basic patient care and consultation.

Demographics

The study of Barton, et al. (2007)⁴ showed that more physician users of telemedicine practiced in public clinics as they serve diverse populations in which telemedicine can be beneficial. Their results also show that younger, recently graduated physicians are likely to be users of telemedicine since they are knowledgeable about the modality and are more likely to perceive the benefits of using telemedicine and less likely to see its barriers, which is in contrast with present study results showing majority of the physicians use telemedicine in their private clinics (55.1%; n=38) and are from the age range of 51-60 (34.8%; n=24).

The study showed that majority of respondents used social network sites for the use of telemedicine. Similarly, in a study by Alanzi and Al-Yami (2019)⁵, their results showed that most physicians in the Kingdom of Saudi Arabia (37.9%) use Facebook as a platform for professional purposes. The same study mentioned that there is an increased social media use in almost all human activities every day. In April 2018, users of Facebook, YouTube, WhatsApp, Facebook Messenger, Instagram, Twitter, Skype, and

Snapchat reached the 2234, 1500, 1300, 813, 330, 300, and 255 million mark, respectively. In a study by Li and Zhang (2020)⁶, it was mentioned that for instant communication and fast decision-making, mobile applications based on picture and text information can be used. Despite some limitations, this method can assist people in determining the severity of the disease and making an early diagnosis.

Usage and Cost-Effectiveness

With regards to usage and cost-effectiveness, although most results showed similarities with prior studies conducted such as telemedicine was easy to use and navigate and was appropriate to use given the pandemic. Participants were in contrast on one matter involving the amount of work-load telemedicine creates.

Indria, et al. (2020)³, observed that while telemedicine has offered some benefits, it has also caused strenuous workload to their participants, affecting alacrity in practicing the modality. Equipment use consumed more time and resulted to inconvenience. In the present study however, with regards to time and workload, 62.3% and 63.8% respectively have responded positively - in disagreement with the conclusion of Indria et. al, 2020.

Filipino physicians who were telemedicine users did not perceive telemedicine as an additional workload. Their being well versed in using different gadgets and the internet was an advantage. Studies by Baruffaldi, et al.⁷ and Vodicka, et al.⁸ mentioned that a physician's knowledge and daily use of equipment - such as smartphones, laptops, tablets and the like, have affected prejudices in the use of telemedicine. Those with familiarity to these devices, and also those who have efficiently acclimated to the new system of telemedicine, by finding comfort and convenience in the method have exhibited higher participation.

The use of telemedicine has grown significantly during the pandemic and it has become the primary form of consultation. Results of the present study have shown that participants are very satisfied with the modality and this may be linked to easy access and integration, according to Johansson, et al. Moreover, results regarding diagnosis of patients have also shown that the participants have become acquitted with the use of telemedicine.

With the recent advancement in technology, telemedicine has become easier to use and more

accessible to physicians. Physicians are now presented with a variety of options (Rho, et al 2014).⁹ A physician's perception of his or her ability to use telemedicine devices has a positive effect on perceived ease of use. This could be one of the reasons why almost 80% of the participants agreed that telemedicine can still be useful even when face-to-face consultation is resumed or permitted in the future.

Advantages

The perceived advantages of telemedicine were availability of access to health care and medical information in remote and rural places and improving patient convenience.

Provision of access to remote or rural patients and improved patient convenience were most evident in this study. According to Johansson, et al. (2017), the healthcare workers who participated in their study agreed that video consultation such as telemedicine provides faster access to specialist care for the patient and greater security. Moreover, they considered this as an opportunity to provide education and for the patients to ask questions, which is similar to the perception of the respondents in the present study with regards to increased patient engagement, satisfaction and convenience during telemedicine consultation.

Another perceived advantage of telemedicine is that it provides access to remote or rural areas to which most of the participants agreed. A study carried out by Johansson, et al. (2014) found that there was uncertainty regarding video consultation as a solution. Although the respondents in their study were familiar with different types of communication technologies, they did not have information on what video consultation would mean to them, which may be because of the lack of knowledge about conducting telemedicine consultation. These concerns served as limitations to the use of telemedicine when it comes to access. In addition, remote areas should have a stable internet connection and a working gadget.

Due to these problems, physicians were making calls and texts through their mobile phones as an alternative for video online consultation. Among the surveyed general practitioners (GPs) in the study, 38% (Leahy, et al., 2017) used text messaging to communicate with their patients. The participants agreed that time management is the key advantage of consultation with the use of text messaging. The patients were also surveyed, and most of them were

pleased to receive text messages from their GPs. This suggests that consultation using text messaging is a fast and efficient way of communication and enhances patient care and satisfaction.

The recent study carried out by Al Hasani, et al. (2020) looked into the perception of physicians with regards to telephone consultation as an alternative technology to face-to-face consultation during COVID-19. All participants acknowledged the use of telephone calls in providing health services and as more advantageous in following COVID-19, chronic and simple cases. The participants expressed that using telephone consultation instead of face-to-face consultation reduces the crowding in primary health care facilities and minimizes risk of COVID-19 transmission. Limitations of the study included limited training in conducting this type of consultation, insufficient technical support, ensuring privacy and confidentiality of the communication. All these however do not alter the fact telephone consultation provides a promising future as a mode of consultation and even beyond this pandemic.

Almost all of the respondents (91% n=63) agreed that use of telemedicine helps improve patient convenience. This statement was supported by a study conducted by Ferrer-Roca, et al. (2010), telemedicine provided similar advantages compared to face-to-face consultation including less travel time, faster diagnosis, health examination and treatment which is in contrast to the present study participants' perception that telemedicine provides faster diagnosis and treatment. This is mainly due to reasons such as lack of examination to provide accurate diagnosis and appropriate treatment when doing telemedicine consultation.

Another is the patient compliance and understanding of the instructions provided by the physician with regards to diagnosis and treatment. It might be difficult for the patient to perform the examination through a video consultation. The patient may be unable to perform correctly or have difficulty understanding and performing the procedure. In face-to-face consultation of the physician does the the examination the patient. The physician also asks a lot of questions about the patient, normally done through observation in a face-to-face consultation. Gutske, et al. (2000)¹⁰ observed that physical examination during a telemedicine consult takes a longer time than if it were done in person. The physician will only rely on the physical examination done by the patient with the help of his/her guardian or nurse wherein they will

be the one to manipulate the stethoscope and other equipment following the instruction of the physician. In a video consultation, the physician will also ask additional questions about the physical characteristics of the patient that can be normally observed when performed in a “hands-on” examination which will take less time.

Currently, the telemedicine set-up in the country is mostly inclined to teleconsultation of simple ailments and concerns of the patient. Participants still perceive that diagnosing and treating the patient is faster during face-to-face consultations compared to telemedicine. This was the reason why the majority disagreed that telemedicine provides faster diagnosis and treatment (26%, n=18).

Challenges

The major challenges in implementing telemedicine include technological problems, limited assessment about patient's condition, security risk in physician and patient information, and there was limited funding for telemedicine.

Technological problems such as slow internet connection, unfamiliar use of gadgets and software were the most common obstacles that were experienced by the participants in this study. It is worth mentioning that the technologies for telemedicine need adequate bandwidth to support decent transmission of data, images, and sound. Consequently, access to broadband is crucial for telemedicine; thus this issue raises challenges for individuals who are living in areas with limited internet access, or vulnerable groups who cannot afford such access.

During the pandemic, practitioners were eager to learn a new method of patient care. However, given the limitations of our country, as mentioned by Pasco, et al. (2016)¹¹, this modality emphasized its limitation in poor technical quality of service providers, hence, suggested better infrastructure that can optimally support this method. Several studies have investigated this, however, the research conducted was limited to our participants, and does not speak for the entire group of practitioners in the country.

The Philippines, in spite of its efforts to achieve parity among neighboring countries, still falls behind in technical qualities such as stable internet connection, which is a vital instrument to render good correspondence between patient and physician in matters of telemedicine. Equipment for telemedicine among varying classes and economic status of patients

and their physicians also pose a deterrent from ideal exchange when one of the two parties or both have malfunctioning, and suboptimal devices to provide a smooth consultation. These are the commonly reported predicaments raised on poor infrastructure.

There is also a challenge in the assessment about a patient's condition as there is a limitation in physical examination. A study by Haimi, et al. (2018)¹², described the challenges of telemedicine services which included difficulties of diagnosing from a distance while according to Lee and Hitt, et al. (2020), diagnosis at a long distance is difficult due to the lack of equipment which could lead to malpractice and legal problems in circumstances of incorrect diagnosis. This was the reason why the use of telemedicine is still limited to basic consultation.

Security risk of physician and patient information also serves as a challenge in implementing telemedicine. There is a challenge in confidentiality which is the provider's inability to have a private environment for the patient due to different work settings, which leads to the providers to encourage the use of headphones, direct questions, and use of Zoom chat panel to allow the patients to type the answers to questions that can limit the disclosure to people near or can readily hear what the conversation about especially if the patients is in crowded living conditions which can mean that they don't have readily accessible devices needed for telemedicine.¹³

As of now the financial hurdles in improving the facilities for telemedicine were still the main obstacle in improving the service. Even though there was a memorandum from the DOH that promoted the use of telemedicine, it was still focused on improving the facilities in the NCR. Financial support was still lacking from the government and actual telemedicine facilities were provided by the private institutions. This can be one of the reasons why telemedicine practitioners were mostly from private institutions.

The identified methodological limitations to this study were the small sample size of the study and limited reliable previous studies about the use of telemedicine during the COVID-19 pandemic. A larger sample size is recommended to ensure a representative distribution of the population of Telemedicine users. If there was a larger sample size, the results of this study can be generalized true and applicable for the population. Since the pandemic, there were limited scholarly articles published in relation to the perception of telemedicine during this time, making this study timely and significant.

CONCLUSION

Majority of the physician-respondents were private practitioners from NCR. Most perceived the use of telemedicine as easy and cost-effective during the pandemic.

Telemedicine also provided access to medical care in remote areas, aside from the safety and convenience provided, as consultations are done in the protected confines of the home. However, there were also perceived downsides to the use of telemedicine – particularly, problems with internet connectivity and the possibility of security risks of patients' medical information.

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