Knowledge, Attitudes, and Practices of Telemedicine in Ophthalmology in a Tertiary Hospital: A Cross-Sectional Survey

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ABSTRACT

Objective: The purposes of this study were to (1) describe the perceptions and practices of telemedicine among ophthalmologists in a tertiary hospital; and (2) evaluate knowledge, satisfaction, and perceived patient outcomes in using telemedicine to provide eye care in a time of a global pandemic.

Methods: This was a descriptive, cross-sectional study using a self-administered online survey. Thirty-two (32) ophthalmology consultants and residents-in-training in a single tertiary, private hospital who practiced telemedicine participated in this study. Descriptive statistics was used to summarize the data. Responses to open-ended questions were analyzed thematically.

Results: The respondents were somewhat knowledgeable (75%) and somewhat confident (72%) in using telemedicine. Respondents strongly conveyed their satisfaction with telemedicine outcomes (56%). Majority also believed that their patients were satisfied with teleconsults (69%). Majority agreed that telemedicine can be effective for select types of care [i.e., chronic condition management (66%), follow- up care (62%), and acute non-emergency care (53%)]. Telemedicine also proved to be a boon during a pandemic due to its convenience (59%) and efficiency (63%). However, it is limited by the imperative need for face-to-face consults (69%) and technological constraints (44%).

Conclusions: Telemedicine was perceived to be a valuable solution during the present pandemic due to its convenience, safety, and ability to provide remote diagnosis and management of urgent and non-urgent cases. Although the current practice of telemedicine still has plenty of room for improvements in the standardization of training, connectivity and technological constraints, and addressing liability concerns, it can serve as an adjunct to face-to face consultations to provide optimal care for patients.

Keywords: Telemedicine, COVID-19, E-health, Teleophthalmology, Pandemic

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In December 2019, the World Health Organization (WHO) declared the coronavirus disease 2019 (COVID-19) as a global public health emergency.[1] COVID-19 is a highly contagious and potentially lethal respiratory infection, which led to a global pandemic.[2] A recent study reported that ocular surfaces may be a potential mode of transmission of COVID-19.[3] In addition, conjunctivitis may also be an early manifestation of the infection and can precede pneumonia by several days.[4,5]

The close physical contact during eye examinations in the clinic puts ophthalmologists at high risk for respiratory droplet transmission as well as through contact with ocular surfaces.[6] In March 2020, the American Academy of Ophthalmology recommended limiting consultations to emergencies.[7] As a result, routine outpatient visits and elective procedures dropped significantly.

A study on the effect of COVID-19 lockdown on ophthalmic practice and patient care in India reported that 75% of respondents were not seeing any patients and of those who were still seeing patients, 82.9% were only seeing emergency patients.[8] A study done at Tan Tock Seng Hospital Eye Center in Singapore revealed an increase in the weekly outpatient visits' no-show rate from 13 to 33%.[9] These numbers suggest a decline in the delivery of ophthalmic care, which could predispose patients to sight-threatening complications.

Several measures were universally recommended to strengthen infection control to maintain delivery of proper eye care.[3] Due to the COVID-19 pandemic, out-patient ophthalmology clinics around the world have adapted outpatient telehealth services to facilitate continuous delivery of proper eye care. Telemedicine refers to a group of services that may be provided to patients without the need for any physical contact or face-to-face interaction. The WHO described telemedicine as having four key elements: (1) provision of clinical support as its purpose; (2) with the intention to overcome geographical barriers; (3) by utilizing Information and Communication Technology (ICT) and; (4) for the improvement of health outcomes.[9] It has been described in the practice of ophthalmology since 1999 by HK Li, wherein he briefly discussed ways in which telemedicine can enhance the practice and distribution of ophthalmology services.[10] In the same study, telemedicine was grouped into three categories: store-and-forward, real-time, and hybrid. Store-and-forward systems acquire medical information at one site, stored digitally, then transmitted to another location where it may be reviewed. Real time systems work synchronously to transmit information simultaneously, such as live video-conferencing and telephone calls. While, hybrid systems combine the capabilities of real time and store-and-forward telemedicine. The store-and forward method is presently being used for screening of diabetic retinopathy.[11]

In a survey done by Nair *et al.*, 78% of respondents had begun telemedicine consultations since the lockdown began.[8] In addition, several studies have recommended applications and protocols of telemedicine in the out-patient eye clinics during the COVID-19 pandemic.[12-14]

In May 2020, Makati Medical Center (MMC) developed its own guidelines and processes for telemedicine consultation, scheduling, and modes of payment to enable physicians to continuously provide services to patients remotely. Consultants were given assistance by the Information Technology department in setting up telemedicine practice. Additionally, a centralized scheduling scheme was developed and teleconsultation platforms were installed in the clinics.

Currently, there are limited studies on practices and perceptions of telemedicine by ophthalmologists locally.[15] Other studies measuring similar outcomes were done in different specialties and settings.[16-19]

This study aimed to describe the practices and perceptions of telemedicine in ophthalmology in a single, tertiary, private institution and identify issues in telemedicine which are unique to the practice of ophthalmology.

METHODOLOGY

This was a descriptive, cross-sectional, observational study using a self-administered online survey. It conformed to the tenets of the Declaration of Helsinki and received approval from the institutional ethics board. Ophthalmology consultants and residents-in-training in MMC who participated in any form of telemedicine or teleconsultation were recruited in this study. Ophthalmologists who did not perform any form of telemedicine or teleconsultation were excluded from the study.

A 58-question, electronic survey was developed and validated. The survey included demographic information, knowledge and perceptions about telemedicine, general features of clinical practice before and during the COVID-19 pandemic, and telemedicine practices. The questions were adapted from other evaluations, reports, and publications.[11,16-18]

Respondents were recruited via electronic mail and short message service (SMS) from October to November 2020. After an informed consent process, a link to the electronic survey in Google forms was sent to the study participants.

Descriptive statistics was used to summarize the general characteristics of the participants. Frequency and proportion were used for nominal variables, median and range for ordinal variables, and mean and standard deviation for interval/ratio variables. Spearman's Rho coefficient was used to determine the degree of association between quarantine status and general features of clinical practice. A p-value <0.05 was considered statistically significant. For open-ended questions, thematic analysis was done.

All valid data were included in the analysis. Missing variables were neither replaced nor estimated. STATA 15.0 was used for data analysis.

RESULTS

Thirty-nine (39) ophthalmology consultants and residents were eligible to participate in the study while 32 (82%) completed the survey.

The 32 survey respondents had a mean age of 43 + 11 years old and 18 (56%) were male. Based on subspecialty, 9 (28%) were general ophthalmologists, 7 (22%) were cornea/external disease/refractive surgeons, 4 (12%) were glaucoma specialties. The mean duration in clinical practice was 8 years (Table 1).

Table 2 shows the study participants' knowledge and confidence levels in practicing telemedicine. The major sources of knowledge on telemedicine were colleagues (87%) and self-training (81%) followed by professional meetings/conferences (62%), mass media (44%), medical literature (31%), grand rounds (25%), and formal telemedicine training (19%). Three-fourths (75%) of the respondents were somewhat knowledgeable while 72% of respondents were somewhat confident about using telemedicine.

Table 1. Demographic profile of respondents (n=32)

Characteristics	
Mean of age + SD, in years	43 ± 11
Sex, n (%)	
Male	18 (56)
Female	14 (44)
Subspecialty, n (%)	
Cornea, External Disease, + Refractive	7 (22)
General Ophthalmology	9 (28)
Glaucoma	4 (12)
Neuro ophthalmology	2 (6)
Ocular Immunology and Uveitis	2 (6)
Vitreo-Retina	2 (6)
Ocuplastics Lacrimal and Orbital Surgery + Ocular Oncology	1 (3)
Pediatric Ophthalmology and Strabismus + Ocular Genetics	1 (3)
Pediatric Ophthalmology and Strabismus + Refractive Surgery	1 (3.13)
Orbit and Oculoplastic Surgery	3 (9)
Mean of length in practice + SD, in years	8 + 10
Range	1 - 35

Table 2. Knowledge and confidence in telemedicine (n=32)

Study respondents' knowledge and confidence level on telemedicine	n (%)
Source of knowledge on telemedicine	
Colleagues	28 (87)
Medical literature	10 (31)
Formal telemedicine training	6 (19)
Mass media	14 (44)
Professional meetings/conferences	20 (62)
Grand rounds	8 (25)
Self-training	26 (81)
Level of knowledge on telemedicine	
Not at all knowledgeable	1 (3)
Somewhat knowledgeable	24 (75)
Very knowledgeable	7 (22)
Level of confidence level in telemedicine	
Not at all confident	4 (12)
Somewhat confident	23 (72)
Very confident	5 (16)

Eleven (11) of the respondents (34%) agreed about considering telemedicine for an initial office visit and that it was likely to be effective for management of chronic conditions (66%), follow-up care (62%), and acute non-emergency care (53%). Eleven (11 or 34%) were neutral about telemedicine being

effective for post-surgical follow-up, while 12 (37%) disagreed with it. Twelve (12 or 37%) were neutral when it came to telemedicine being more likely to be effective for emergent care.

In terms of outcomes and satisfaction, 19 respondents (59%) agreed that telemedicine can provide desirable results in diagnosis/treatment and that it is beneficial for their practice. Eighteen (18) respondents (56%) agreed that clinical decision making can be accomplished with telemedicine and were satisfied with telemedicine outcomes. In addition, 20 (62%) also claimed that they would promote telemedicine to their colleagues and 22 (69%) had patients that were satisfied with telemedicine consultations. Twenty-two (22) respondents (69%) completely agreed that patients were more likely to get better care when seen in face-to-face consultation and that a patient's presence was necessary for adequate physical examination (Table 3).

Table 3. Survey results on perceptions on telemedicine (n=32)

	Completely agreed n (%)	Agreed n (%)	Was Neutral n (%)	Disagreed n (%)	Completely disagreed n (%)
Beliefs about patient care and outcomes					
Patient more likely to get better care when seen in face-to-face consult	22 (69)	8 (25)	0	2 (6)	0
Telemedicine can be used for follow-up care	5 (16)	20 (62)	7 (22)	0	0
Telemedicine more likely to be effective for emergent care	1 (3)	5 (16)	12 (37)	10 (31)	4 (12)
Telemedicine more likely to be effective for chronic condition management	2 (6)	21 (66)	5 (16)	4 (12)	0
Telemedicine can be considered for initial office visits	2 (6)	11 (34)	10 (31)	7 (22)	2 (6)
Telemedicine can be effective for post-surgical follow-up	0	7 (22)	11 (34)	12 (37)	2 (6)
Telemedicine can be effective for acute non-emergency care	7 (22)	17 (53)	5 (16)	3 (9)	0
Patient's presence is necessary for adequate physical exam	22 (69)	7 (22)	3 (9)	0	0
Telemedicine can provide desirable results in diagnosis/ treatments	0	19 (59)	11 (34)	2 (6)	0
Telemedicine can be beneficial for your practice	6 (19)	19 (59)	4 (12)	2 (6)	1 (3)
You would promote telemedicine to your colleagues	3 (9)	20 (62)	6 (19)	3 (9)	0
Clinical decision making can be accomplished with telemedicine	3 (9)	18 (56)	8 (25)	2 (6)	1 (3)
Improved patient prognosis with telemedicine	0	10 (31)	14 (44)	8 (25)	0
You are satisfied with telemedicine outcomes	0	18 (56)	11 (34)	3 (9)	0
Your patients are satisfied with telemedicine consults	0	22 (69)	9 (28)	1 (3)	0
Use of telemedicine would not be an effective use of time	0	6 (19)	6 (19)	16 (50)	4 (12)
Time and convenience in use of telemedicine					
Would put up with some inconvenience in order to use telemedicine	1 (3)	21 (66)	7 (22)	3 (9)	0
Telemedicine facilities are convenient for use	7 (22)	19 (59)	5 (16)	1 (3)	0
Scheduling telemedicine appointments would be disruptive to office routine	0	5 (16)	6 (19)	16 (50)	5 (16)
Reduced travel for consultants, that is possible with the use of telemedicine, is important	2 (6)	20 (62)	6 (19)	4 (12)	0
Concerns about licensure, credentialing, malpractice					
Concerned about liability issues if telemedicine is used	8 (25)	18 (56)	4 (12)	2 (6)	0
Use of telemedicine would increase the risk of malpractice suits	3 (9)	16 (50)	9 (28)	4 (12)	0
Reimbursement issues in teleophthalmology					
Compensation for use of telemedicine should be on a par with face-to-face consult	4 (12)	13 (41)	7 (22)	5 (16)	3 (9)
Satisfied with reimbursement received with telemedicine	1 (3)	15 (47)	12 (37)	3 (9)	1 (3

Telemedicine was perceived to be efficient and convenient as half (50%) disagreed that the use of telemedicine would not be an effective use of time and scheduling telemedicine would be disruptive to office routine. Twenty-one (21) respondents (66%) also agreed that they were willing to put up with some inconvenience in order to use telemedicine and 19 (59%) agreed that telemedicine facilities were convenient for use (Table 3).

Meanwhile, more than half of the respondents (56%) agreed that they were concerned about liability issues if telemedicine is used. Half of the respondents (50%) agreed that the use of telemedicine would increase the risk of malpractice suits (Table 3). Thirteen (13) respondents (41%) agreed that the compensation for use of telemedicine should be at par with face-to-face consultations and 15 (47%) were satisfied with reimbursements received from telemedicine (Table 3).

Before the COVID-19 pandemic, 21 (66%) had 10 to 40 hours of face-to-face outpatient consultations in a typical week. Thirty-one (31 or 97%) spent less than 10 hours weekly on telemedicine. Nineteen (19 or 59%) spent 5 to 15 minutes for each patient in a typical telemedicine consultation. During the enhanced community quarantine (ECQ) in the COVID pandemic, more than half of the respondents (56%) spent less than 10 hours of face-to-face outpatient consultations in a typical week. Twenty-six (26 or 81%) spent less than 10 hours on telemedicine in a week, while 6 (19%) were engaged on telemedicine between 10 to 40 hours a week. Twenty (20 or 62%) spent 15 to 30 minutes with each patient in a typical telemedicine consultation. During general community quarantine (GCQ) in the COVID pandemic, 19 (59%) spent 10 to 40 hours of face-to-face outpatient consultations in a typical week. Twenty-six (26 or 81%) spent less than 10 hours on telemedicine practice. More than half of the respondents (56%) spent 15 to 30 minutes per patient for each telemedicine consultation. Quarantine status is found to be significantly associated with hours of face-to-face outpatient consults in a typical week ($p<0.0001$) and time allotted for each patient in a typical telemedicine consult ($p = 0.02$). Meanwhile, the top 3 most common platforms used for telemedicine during GCQ were Viber® (87%), short message service or SMS (62%), and video call (66%). The other platforms reported were phone call (59%), e-mail (37%), Zoom® (16%), Facebook® (3%), SeriousMD (3%), and VirtualConsult.ph (3%).

Table 4. General features of clinical practice

	Pre-pandemic n (%)	**ECQ** n (%)	**GCQ** n (%)	**Spearman's Rho**	**P- value**
Clinic hours/face-to-face outpatient consults in a typical week					
<10 hours	4 (12)	18 (56)	10 (31)	-0.41	<0.0001
10 - 40 hours	21 (66)	13 (41)	19 (59)		
41 - 60 hours	6 (19)	1 (3)	3 (9)		
>60 hours	1 (3)	0	0		
Telemedicine practice in a typical week					
<10 hours	31 (97)	26 (81)	26 (81)	0.19	0.07
10 - 40 hours	1 (3)	6 (19)	6 (19)		
41 - 60 hours	0	0	0		
>60 hours	0	0	0		
Time allotted for each patient in a typical face-to-face consult					
5 - 15 minutes	9 (28)	13 (41)	13 (40)	-0.13	0.21
15 - 30 minutes	17 (53)	16 (50)	14 (44)		
31 - 60 minutes	6 (19)	3 (9)	5 (16)		
>60 minutes	0	0	0		
Time allotted for each patient in a typical telemedicine consult					
5 - 15 minutes	19 (59)	9 (28)	12 (37)	0.24	0.02
15 - 30 minutes	11 (34)	20 (62)	18 (56)		
31 - 60 minutes	2 (6)	3 (9)	2 (6)		
>60 minutes	0	0	0		

*ECQ - enhanced community quarantine, GCQ - general community quarantine

The most common causes of cancellation or incomplete telemedicine sessions were the patient's non-attendance (56%), internet connectivity problems (44%), technical difficulties (34%), unavailable clinician (31%), and patient's non-consent to engage in telemedicine (25%). Meanwhile, 15 (47%) respondents were often able to make a diagnosis and 17 (53%) were able to provide treatment. Majority (25 or 78%) of the respondents provided picture prescriptions and only 3 (9%) used third-party applications.

Half (16 or 50%) of the respondents used electronic medical records for record keeping, while 15 (47%) maintained paper charts. For patient disposition, 19 (59%) said they required physical consultation after a teleconsult, while 11 (34%) say that the consultation was complete or appropriate. As for the mode of payment of professional fees,

26 (81%) used online bank transfers, 17 (53%) used cash, and 13 (41%) used PayMaya (Table 5).

Table 5. Practices of telemedicine

Survey questions	n, (%)
Common causes of cancellation or incomplete telemedicine session	
Patient refused	8 (25)
Patient no show	18 (56)
Clinician unavailable	10 (31)
Telemedicine tech did not work	14 (44)
Technical difficulties	11 (34)
Physician was able to make diagnosis	
Always	5 (16)
Often	15 (47)
Sometimes	10 (31)
Rarely	2 (6)
Never	0
Physician was able to provide treatment	
Always	5 (16)
Often	17 (53)
Sometimes	10 (31)
Rarely	0
Never	0
Method medical prescription was given	
Picture prescription	25 (78)
Third-party app	3 (9)
Others	4 (12)
Record keeping	
EMR	16 (50)
Paper chart	15 (47)
Others	1 (3)
Patient disposition	
Complete / Appropriate	11 (34)
Needs physical consult	19 (59)
Inappropriate consultation	2 (6)
Payment modes for professional fees	
Online transfer	26 (81)
Cash	17 (53)
PayMaya®	13 (41)
HMO	1 (3)

*HMO - health maintenance organization

The top three diagnoses made through telemedicine Pre-COVID, during ECQ and GCQ were conjunctivitis, hordeolum and dry eye syndrome.

Thematic Analysis of Open-ended Questions

Responses to open-ended questions were classified into three (3) categories: advantages of telemedicine, challenges faced with telemedicine, and indication for a face-to-face consultation.

The study respondents' perception on the advantages of telemedicine include user experience where telemedicine provides convenience and safety without compromising rapport especially to individuals who are unable to leave their homes. They affirmed that telemedicine offers a viable solution to lessen the possibility of virus transmission and infection from face-to-face consults. Study participants perceived that telemedicine is also effective for first consults, follow-ups, and non-urgent cases. This suggests that telemedicine can be used as an adjunct to optimum eye care and a valuable tool that could augment the existing clinical practice enabling the healthcare providers to prioritize urgent from non-urgent cases, reduce the time spent in face-to-face consults, and obtain necessary patient details prior to physical consult and treatment. Moreover, the respondents acknowledged the efficiency of telemedicine as they can accommodate as many patients as they can even outside their clinic hours.

The perceived disadvantages of telemedicine include unreliable or poor internet connectivity and inadequate technology. The need for further face-to-face consultation for physical examination was also emphasized as the respondents brought up the possibility of incomplete diagnosis or misdiagnosis. Some of their patients also did not have adequate devices to provide a clear image quality. Finally, due to the easy accessibility of the respondents through SMS and online platforms, patients were able to contact their healthcare providers beyond clinic hours resulting in a lack of doctor-patient boundaries.

The common indications for requesting face-to-face consults was also further explored. The respondents classified them as cases that are emergent, beyond a simple eye redness or dry eye, persistent, and cases with specific symptoms.

DISCUSSION

In May 2020, guidelines and processes for starting telemedicine practice were developed by the Makati Medical Hospital. A telemedicine task force was formed which rolled out a standard telemedicine guide for physicians. Assistance from the Information Technology (IT) department in setting up telemedicine practice was provided to enable the medical staff to continuously provide services to patients. Despite the support dispensed by the hospital, majority of the respondents in our study still claimed that they were only somewhat knowledgeable and somewhat confident about practicing telemedicine. It could then be inferred that without the institution's telemedicine initiative, the knowledge, acceptance, and confidence level of the respondents would have been lower. Furthermore, the respondents' moderate knowledge and confidence level are reinforced by our findings that only 19% had formal telemedicine training. Improving the degree of confidence and knowledge on telemedicine therefore entails equipping health care providers with formal training. This is in agreement with the study by Yaghobian *et al.*, where 83% of the participants declared telemedicine was relevant to improve access to care but 98% stated that they were not trained enough as only 14% received theoretical education on telemedicine.[20] The authors also recommended integrating telemedicine education and training in medical schools and residency programs.

In terms of perception on patient care and outcomes, most of the respondents believed that telemedicine was beneficial to their practice as it effectively aided them in providing non-urgent types of care and delivering desirable results in diagnosis/ treatment. These claims are further supported by their willingness to promote telemedicine to colleagues, and personal and perceived patient satisfactions with telemedicine outcomes. Our findings are similar to the study by Acharya *et al.* wherein 94 and 90% of physicians from different specialties perceived that telemedicine service provided desirable results in their patient's diagnosis/treatment and to be cost-effective, respectively.[19] A recently published local study also found that 61% of 327 surveyed ophthalmologists perceived tele-ophthalmology to have a positive overall effect on their clinical practice.[15]

Despite the apparent benefits of telemedicine, majority strongly believed that patients were more likely to get better care when seen face-to-face and that face-to-face consultation was necessary for adequate physical examination. The necessity of face-to-face consultation was perceived especially important for eye diseases that require emergent care, post-surgical follow up, and improving patient prognosis. Moreover, the undisputable convenience provided by telemedicine and the respondents' satisfaction with compensation are not without caveats as 41% also expressed their concerns on liability issues and increased risk of malpractice. Correspondingly, a study done by Woodward and company showed that more than half of the physicians had low confidence in remote care for providing a medical opinion. This study, however, was done in a non-pandemic setting.[11] A few published studies agree that this pandemic has allowed ophthalmologists to consider other ways that real-time systems could be used for patient care as well as expansion of its usage and applications during a global pandemic.[8-13]

Clinical practice for both face-to-face and telemedicine changed when the pandemic hit. While clinic hours and time allotted to each patient during face-to-face outpatient consultations dropped at the peak of the restrictions (i.e. ECQ), time spent for telemedicine consultations inevitably increased.

Challenges in telemedicine include internet connection speed and reliability, device usage literacy, and poor image quality. A respondent answered poor visualization as one of the pitfalls of telemedicine especially in the field of ophthalmology. Ophthalmologists heavily rely on visual information to come up with the correct diagnosis and the 2-dimensional nature of standard images and videos limits the ability to visualize intraocular structures. In fact, Woodward *et al.* reported that as much as 59% of ophthalmologists had low confidence in their ability to make clinical decisions based on images alone.[11] Moreover, it is not uncommon that face-to-face examination is requested after a telemedicine consultation especially for urgent and emergent cases and persistent cases that showed no resolution. Although telemedicine is convenient and a valuable alternative during a pandemic, it cannot be a substitute to a face-to-face consultation. It can only be treated as an adjunct to the existing in-person clinical practice. Nonetheless, Azarcon *et al.* found that 84% of their participants believed that the practice of tele-ophthalmology in the Philippines can be adopted on a wider scale in the next few years.[15]

This study is limited by the low number of

participants, a narrow scope, and perceptions on telemedicine during the present pandemic. Recommendations for future researches on telemedicine include a higher number of respondents, investigation of the outlook on telemedicine post-pandemic, and exploration of the integration of telemedicine in medical school, residency training, and clinical practice.

In conclusion, telemedicine was perceived to be a valuable solution during the present pandemic due to its convenience, safety, and ability to provide remote diagnosis and management of urgent and non-urgent cases. As an important adjunct to healthcare, certain issues on telemedicine including formal training, connectivity, technological capabilities, and liability concerns should be addressed. Nevertheless, the innovative steps and solutions set in place during the present pandemic can be a foundation to establish and develop telemedicine not only in the hospital but also in the Philippines.

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APPENDIX

A. PHYSICIAN CHARACTERISTICS

a. Age:	b. Sex: ☐ Male ☐ Female	c. Subspecialty:	d. Years of Practice:

B. KNOWLEDGE IN TELEMEDICINE

a. Knowledge source for telemedicine (check all that apply)

☐ Colleagues ☐ Medical literature ☐ Formal telemedicine training ☐ Mass media ☐ Professional meetings/conferences
☐ Medical or postgraduate training ☐ Grand rounds ☐ Self-learning ☐ Others: _____

b. Knowledge level about telemedicine	☐ Not at all knowledgeable	☐ Somewhat knowledgeable	☐ Very knowledgeable
c. Confidence level about telemedicine	☐ Not at all confident	☐ Somewhat confident	☐ Very confident

d. What medium is your concept of telemedicine? (choose all that apply)

☐ Zoom Skype WebEx Google ☐ FB Messenger (w/w/o video call) ☐ Viber (w/w/o video call)
☐ Phone call ☐ SMS ☐ Software/apps ☐ Others: _____

C. PERCEPTIONS/ATTITUDE WITH TELEMEDICINE

a. BELIEFS ABOUT PATIENT CARE AND OUTCOMES	Completely agree	Agree	Neutral	Disagree	Completely disagree
i. Patient more likely to get better care when seen in face-to-face consult	☐	☐	☐	☐	☐
ii. Telemedicine can be used for follow-up care	☐	☐	☐	☐	☐
iii. Telemedicine more likely to be effective for emergent care	☐	☐	☐	☐	☐
iv. Telemedicine more likely to be effective for chronic condition management	☐	☐	☐	☐	☐
v. Telemedicine can be considered for initial office visits	☐	☐	☐	☐	☐
vi. Telemedicine can be effective for postsurgical follow-up	☐	☐	☐	☐	☐
vii. Telemedicine can be effective for acute nonemergency care	☐	☐	☐	☐	☐
viii. The patient's presence is necessary for an adequate physical exam	☐	☐	☐	☐	☐
ix. Telemedicine can provide desirable results in diagnosis/treatment	☐	☐	☐	☐	☐
x. Telemedicine can be beneficial for your practice	☐	☐	☐	☐	☐
xi. You would promote telemedicine to your colleagues	☐	☐	☐	☐	☐
xii. Clinical decision making can be accomplished with telemedicine	☐	☐	☐	☐	☐
xiii. Improved patient prognosis with telemedicine	☐	☐	☐	☐	☐
xiv. You are satisfied with telemedicine outcomes	☐	☐	☐	☐	☐
xv. Your patients are satisfied with telemedicine consults	☐	☐	☐	☐	☐
b. TIME AND CONVENIENCE IN USE OF TELEMEDICINE	Completely agree	Agree	Neutral	Disagree	Completely disagree
i. Use of telemedicine would not be an effective use of time	☐	☐	☐	☐	☐
ii. Would put up with some inconvenience in order to use telemedicine	☐	☐	☐	☐	☐
iii. Telemedicine facilities are convenient for use	☐	☐	☐	☐	☐
iv. Scheduling telemedicine appointments would be disruptive to office routine	☐	☐	☐	☐	☐
v. Reduced office trips of consultants, that is possible with telemedicine, is important	☐	☐	☐	☐	☐
c. CONCERNS ABOUT LICENSURE, CREDENTIALING, MALPRACTICE	Completely agree	Agree	Neutral	Disagree	Completely disagree
i. Concerned about liability issues if telemedicine is used	☐	☐	☐	☐	☐
ii. Use of telemedicine would increase the risk of malpractice suits	☐	☐	☐	☐	☐
d. REIMBURSEMENT	☐	☐	☐	☐	☐
i. Compensation for use of telemedicine should be on a par with face-to-face consult	☐	☐	☐	☐	☐
ii. Satisfied with reimbursement received with telemedicine	☐	☐	☐	☐	☐

D. GENERAL FEATURES OF CLINICAL PRACTICE (PRE-COVID)

a. How many clinic hours/face-to-face consults do you hold in a typical week (outpatient only)?

☐ <10 hrs/wk ☐ Approx. 10-40 hrs/week ☐ Approx. 41-60 hrs/wk ☐ >60 hrs/wk ☐ N/A

b. How many hours do you do TELEMEDICINE in a typical week?

☐ <10 hrs/wk ☐ Approx. 10-40 hrs/week ☐ Approx. 41-60 hrs/wk ☐ >60 hrs/wk ☐ N/A

c. During a typical outpatient/face-to-face consult, approximately how much time is allotted for each patient?

☐ 5-15 mins. ☐ 15-30 mins. ☐ 30-60 mins. ☐ >60 mins ☐ N/A

d. During a typical TELEMEDICINE consult, approximately how much time is allotted for each patient?
☐ 5-15 mins. ☐ 15-30 mins. ☐ 30-60 mins. ☐ >60 mins ☐ N/A

e. What platform/s do you use for TELEMEDICINE? (choose all that apply) SMS ☐ Viber ☐ E-mail
☐ Phone call ☐ Video call ☐ Others: _____ ☐ N/A

f. Common diagnoses made/applicable/consulted in TELEMEDICINE (enumerate)

g. Most common use for TELEMEDICINE (rank 1, most common, 4 least)
_____ diagnosis/initial consult _____ follow-up _____ post-op follow-up
_____ chronic disease management others: _____

E. GENERAL FEATURES OF CLINICAL PRACTICE (DURING COVID PANDEMIC – ECQ)

a. How many clinic hours/face-to-face consults do you hold in a typical week (outpatient only)?
☐ <10 hrs/wk ☐ Approx. 10-40 hrs/week ☐ Approx. 41-60 hrs/wk ☐ >60 hrs/wk ☐ N/A

b. How many hours do you do TELEMEDICINE in a typical week?
☐ <10 hrs/wk ☐ Approx. 10-40 hrs/week ☐ Approx. 41-60 hrs/wk ☐ >60 hrs/wk ☐ N/A

c. During a typical outpatient/face-to-face consult, approximately how much time is allotted for each patient?
☐ 5-15 mins. ☐ 15-30 mins. ☐ 30-60 mins. ☐ >60 mins ☐ N/A

d. During a typical TELEMEDICINE consult, approximately how much time is allotted for each patient?
☐ 5-15 mins. ☐ 15-30 mins. ☐ 30-60 mins. ☐ >60 mins ☐ N/A

e. What platform/s do you use for TELEMEDICINE? (choose all that apply) SMS ☐ Viber ☐ E-mail
☐ Phone call ☐ Video call ☐ Others: _____ ☐ N/A

f. Common diagnoses made/applicable/consulted in TELEMEDICINE (enumerate)

g. Most common use for TELEMEDICINE (rank 1, most common, 4 least)
_____ diagnosis/initial consult _____ follow-up _____ post-op follow-up
_____ chronic disease management others: _____

F. GENERAL FEATURES OF CLINICAL PRACTICE (DURING COVID PANDEMIC - GCQ)

a. How many clinic hours/face-to-face consults do you hold in a typical week (outpatient only)?
☐ <10 hrs/wk ☐ Approx. 10-40 hrs/week ☐ Approx. 41-60 hrs/wk ☐ >60 hrs/wk ☐ N/A

b. How many hours do you do TELEMEDICINE in a typical week?
☐ <10 hrs/wk ☐ Approx. 10-40 hrs/week ☐ Approx. 41-60 hrs/wk ☐ >60 hrs/wk ☐ N/A

c. During a typical outpatient/face-to-face consult, approximately how much time is allotted for each patient?
☐ 5-15 mins. ☐ 15-30 mins. ☐ 30-60 mins. ☐ >60 mins ☐ N/A

d. During a typical TELEMEDICINE consult, approximately how much time is allotted for each patient?
☐ 5-15 mins. ☐ 15-30 mins. ☐ 30-60 mins. ☐ >60 mins ☐ N/A

e. What platform/s do you use for TELEMEDICINE? (choose all that apply) SMS ☐ Viber ☐ E-mail
☐ Phone call ☐ Video call ☐ Others: _____ ☐ N/A

f. Common diagnoses made/applicable/consulted in TELEMEDICINE (enumerate)

g. Most common use for TELEMEDICINE (rank 1, most common, 4 least)
_____ diagnosis/initial consult _____ follow-up _____ post-op follow-up
_____ chronic disease management others: _____

G. TELEMEDICINE PRACTICES

i. Common causes of cancellation/incomplete telemedicine session (difficulties)
☐ patient refused ☐ patient no show ☐ clinician unavailable ☐ telemedicine tech did not work (connection, technical difficulties)

ii. In your opinion, what are the advantages to telemedicine?

iii. What were the challenges that you faced with telemedicine, and how were these overcome?

iv. In your opinion, what issues or concerns are unique to telemedicine?

v. Are you able to make a diagnosis with telemedicine? ☐ never ☐ always ☐ often ☐ sometimes ☐ rarely

vi. Are you able to provide treatment with telemedicine? ☐ always ☐ often ☐ sometimes ☐ rarely ☐ never

vii. How do you give prescriptions after a telemedicine session?
☐ Picture prescription ☐ Third-party application ☐ Others: _____

viii. How do you keep patient records? (EMR, paper chart, others)
☐ EMR ☐ Paper charts ☐ Others: _____

ix. What is the usual patient disposition after telemedicine?
☐ Inappropriate consultation ☐ Needs physical consult ☐ Complete ☐ Others: _____

x. What are common indications for requesting face-to-face consult?

xi. What payment modes do you use for telemedicine?
☐ Cash ☐ PayMaya ☐ Online Transfer ☐ Others: _____