

## Original Article



## Ethical and Professional Challenges of Telemedicine Usage in Providing Healthcare Services during COVID-19 Pandemic

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### ABSTRACT

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**Background:** Telemedicine platforms are ideal tools for managing many challenges facing healthcare systems in response to global infectious outbreaks. Increased the telemedicine during COVID-19 outbreak to cope with social isolation as an effective preventive measure to reduce the disease burden on the healthcare systems may associate with the development of ethical, and professional risks in the context of health. **Aim of the study:** to evaluate the ongoing ethical, professional and legal challenges associated with increased telemedicine services during COVID-19 in the Egyptian community.

**Material& Methods:** The study is a cross sectional questionnaire-based study, the electronic questionnaire was disseminated to the participants through social media means and emails. **Results:** the participants' total number in the study was 982 (526 physicians, and 456 service recipients). More than half of the service recipients were using what's app in telemedicine (59.3%). Telemedicine usage during COVID-19 pandemic increased to be nearly doubled (from 42.2 % to 84.8%). (65.5%) of service recipients expressed multi-benefits of telemedicine for the community during COVID -19 pandemic while nearly equal percent of the participant physicians (67.7%) expressed the presence of multiple risks affecting them associated with electronic health services whilst lesser percentages expressed one risk presence: Professional risks (23.2%), ethical risks (11.8%), personal risks (8.7%), and legal risks (6.7%) for the physicians. Even though multiple risks threaten the physicians practicing telemedicine they attempt many measures for best practice of telemedicine as keeping physician-patient boundaries, time control, and asking for the reports of the investigations. **Conclusion:** Telemedicine provides great remote health services during recent outbreaks as during COVID-19 pandemic, but also carries greater risks of ethical, professional, legal, and personal aspects,

and enhance medical practice. Physicians should pay attention to the ethical sensitivity in relationships with the patients in addition to maintain a good doctor-patient relationship, protecting the privacy of the patient, promoting equality in access, and treatment, and seeking the best possible outcomes.

**Keywords:** *COVID-19* pandemic, telemedicine, ethics, medico-legal issues, corona; professionalism.

## I. INTRODUCTION

A novel corona virus, emerged in Wuhan, China, at the end of 2019 designated as 2019-nCoV, Corona viruses are formed of a broad family of viruses that capable of infecting birds, and mammals, including humans (**El-Aziz et al., 2021**). There is a considerable high risk of *COVID-19* transmission in both health, and social institutions, especially with vulnerable populations (**El Shehaby et al., 2022**). The application of efficient infection control measures can greatly reduce the impact of transmission on the health, and social institutions (**Mark et al., 2020**). Social distancing measures is one of the most effective preventive measures that should be implemented to interrupt the chains of human-to-human transmission so preventing any further spread, reducing the severity of the pandemic, and slowing down the increase in crisis, while allowing the systems of healthcare to manage an increased patients' influx (**Pellis et al., 2021**).

Telemedicine is the use of electronic information and communication technologies to provide health care over a distance, so it is a

form of electronic communication that enable individuals and communities to gather, communicate, share personal messages, share various types of information, and in some cases collaborate. Examples of social media are used include Twitter, Facebook, YouTube, what's app, LinkedIn and blogs (**Greysen et al., 2010**). The majority of telemedicine services are for the disease diagnosis, and its clinical management, in addition to the biometric measurement tools of blood glucose, blood pressure, heart rate, and are used to manage, and follow up patients with acute, and chronic illnesses (**Heinzelmann et al., 2005**).

Telemedicine's benefits can be summarized into; enhanced quality of health care and health educational benefits through improvement of the patient and the general population access to health information (**Jain, 2009**) and recently during *COVID-19* outbreak to cope with social isolation as an effective preventive measure to reduce the disease burden on the health care systems (**Strehle & Shabde, 2006**). In addition to the benefit of time-saving & control with increasing the trust in the profession and

strengthening the doctor-patient relationship (Barry et al., 2001).

Telemedicine carries greater risks of legal, ethical, and professional aspects side by side of its many advantages. Therefore, physicians using social media should pay attention to the ethical sensitivity in their patient relationships (Budd, 2013). Direct physician contact with patients (which is regulated) differs from other largely unregulated telehealth activities (Scott & Mendez-Shannon, 2017).

Telemedicine's ethical risks that are a significant impediment to medico-legal judgement and ethical discussion as these concerned; informed consent, patient information security and confidentiality and doctor-patient relationship. They are concerned with the use, rights, responsibilities, and ownership of the many elements linked with electronic medical data transfer (McLean, 2005).

Telemedicine's professional risks include: misdiagnosis which is common with telemedicine as telehealth visits are through a screen so lack of physical examination (Luxton et al., 2014). Online prescribing is another professional risk, some jurisdictions ban internet doctors from prescribing drugs to patients because medical products can only be provided to patients if the patient and the doctor

have had prior direct contact. Treatments and diagnoses provided via the internet and over the phone are insufficient, putting patients' health at risk (Wilkes et al., 2000).

Telemedicine's personal risk is Cyberbullying & Defamation which is unprofessional and has a detrimental impact on the victim and those around them. (Sutton, 2017). While its legal risks is licensing of medical practice, practicing medicine without a legal license is a criminal violation in most nations. The primary goal of licensing is to ensure that physicians achieve academic and clinical competence criteria so that the public is protected from unfit or impaired practitioners. (Daly, 2000)

### **Aim of the study**

#### **The study was designed for:**

- 1- Assessment of the extent, purposes, of telemedicine regarding health services in the period of *COVID-19* pandemic in Egyptian community with measuring the extent of the public's awareness of seeking medical advice through telemedicine
- 2- Assessment of the implementations of professional, and ethical standards of such process
- 3- Discussion of associated inherent ethical, and professional risks of the telemedicine, and

establishing a protecting framework of their respective interests

## II. SUBJECTS & METHODS

### Type of the study

The study is a descriptive cross-sectional questionnaire-based study; an electronic questionnaire is distributed through social media (what's app, face book pages (personal & social), and messenger), and emails to the Physicians,, and to service receivers who expressed an interest in participation in the study by filling the questionnaire forum after receiving information about the study that was written in a clear form at the top of the electronic questionnaire during the period of 15<sup>th</sup> March to 15<sup>th</sup> May 2020.

### Pilot study:

A preliminary questionnaire trial was carried out on 80 participants to:

- Test the clarity of the questions especially the added questions, for any required modification.
- Estimate the required time for implementing the questionnaire.
- Testing the feasibility, and flow of work
- Assess the relationships among different items

The results of this assessment were used to modify the trial questionnaire to the

final one before being administered to the participants.

### Sample size calculation

The minimum estimated sample size was 425. It was estimated using the EPI info statistical package Version 7. The parameters used to estimate the sample size were; assumed proportion 0.5 (due to novel research idea, and absence of previous studies ethical, and professional aspect of telemedicine among Egyptian health care providers, a 95% confidence level, and 5% margin of error.

Data will be collected using Google online self-administered questionnaire disseminated in Arabic language. The questionnaire is consisting of:

- A. The first section of the questionnaire was distributed to (medical students of different academic, and clinical years. Also, physicians (General practitioners, residents, specialists, and professionals) of General Governmental, and University Hospitals all over Egypt Governorates. This first part includes questions about:
  - 1- Demographic criteria of the participant physicians (age, sex, level of medical education, and residence)
  - 2- The extent, and proposes of physicians' usage of telemedicine during the usual times, and during the period of *COVID-19* Pandemic

- 3- The knowledge about the inherent ethical & professional risks of their social media usage in providing health services
- 4- The implementations of professional, and ethical standards of such communication process to reach the best result from the service
- 5- The requirement for clear rules, and guidelines to control such health service process to prevent associated conflicts of interests.

**B.** The second section of the questionnaire was distributed to telemedicine recipients in the Egyptian community, and includes questions about:

1. Demographic criteria of the recipient's participants (age, sex, education level, and residence)
2. The extent, and propose of social media usage for asking, and receiving health services concerning the diagnosis, and treatment prescription during the usual times, and during the period of *COVID-19* Pandemic
3. The requirement of such service during the pandemic of infectious disease.
4. The frequency of social media applications used for telemedicine health care services.
5. Items assessing of the patients' satisfaction about telemedicine received services during *COVID-19* Pandemic

**Inclusion criteria:**

-Adult Egyptian not less than 18 years old.

**Exclusion criteria:**

- 1- Egyptian less than 18 years old.
- 2- Adult Egyptian not living in Egypt.

**Ethical Considerations**

The study was approved by the Ethical Committee of Faculty of Medicine, Assiut University under IRB No: 17300526.

Implicit consent from the participants is expressed as the title, and the aim of the study in simple terms was present as a first item in the questionnaire forum. Confidentiality of the information was maintained during the steps of the study. No harm to the participant was expected during all steps of the study. The trial was registered at clinical trial.gov with unique ID number [NCT04351568](#).

**Statistical analysis**

Data were tabulated in an Excel sheet using Microsoft office 2010, then were analyzed using advanced statistical package for social sciences version 20.0 (SPSS, Inc., Chicago, IL). The results were expressed as frequency, and percent in qualitative data, and mean  $\pm$  SD for quantitative data.

**III. RESULTS**

Table (1) showed the demographic characteristics of the participating physicians, and revealed that their number was 526, more than the half (59.8%) were aged 30- >50 yrs.

(n=314), more than the third 37.9% were in the ages of 18- >30 yrs (n= 200), and 2.3% were  $\geq$  50 yrs.(n=12). Female participants were 71.8 % (n = 377), while male participants were 28.2% (n =149). About one third of the participant physicians were specialists (37.1 %), followed by medical students in their first 3 years of academic medical education (17%), (13.7%) were house officers, (12.5%) consultants, lastly, 11.4% were general practitioners, and (8.3%) were in their final clinical 3 years of medical education.

Table (2) showed the demographic characteristics of the participating telemedicine recipients, and revealed that the number of the participants was 456. Out of this number 208 45.6% aged 18- <30 yrs. represent 45.6% while 50% aged 30- >50 yrs., 4.4% were  $\geq$ 50 years old. As regards gender 70.8 % were female, and 29.2% were male. Concerning their educational level, most of them were of university education (53.9%) (n=246), 39.5% were postgraduates (n=180), and 6.6% were below secondary education (n=30).

Figure (1) showed the extent of telemedicine usage before, and during COVID-19 pandemic and revealed that telemedicine usage before COVID-19 pandemic was (42.2 %) while during COVID-19 pandemic increased to be nearly doubled (84.8%)

Figure (2) showed the frequency of the preferred specialties in telemedicine services from the participants' point of view, and revealed that more than half of the participants interested in receiving telemedicine service in any specialties of health care services (56.8%), followed by telemedicine services in pediatric, and internal medicine (22.2%), then dermatology health services (12.5%), while the least percentage were psychological sessions, and advices in surgical purposes (7.1%, and 1.4%) respectively

Figure (3) showed the frequency of social media applications used in the telemedicine services, and revealed that what's app was the most frequent one (59.3%), followed by Facebook (24%) then messenger, whilst small percent was using telemedicine implementation systems (8%), and telephone (1.7%)

Figure (4) showed benefit assessment from telemedicine for the community during COVID -19 pandemic, and revealed, more than half of the participants (65.5%) expressed that telemedicine during this period is a multi-benefits service (social distancing & infection control measure, time-saving service,, and cost-saving service) lesser percentages of the participants expressed single benefit acquirement from telemedicine during *COVID-19* as: infection control measure (17.3%),

(15.2% %) time-saving service, and (2%) expressed its a cost-saving service.

Figure (5) showed risk assessment for the physicians associated with telemedicine services, and revealed that; a great majority of the physicians (67.7%) expressed the presence of multiple risks (Ethical, Professional, Legal, and Personal) associated with providing the health care services by this process whilst lesser percentages expressed one risk presence: Professional risks (23.2%), ethical risks (11.8%), personal risks (8.7%), and legal risks (6.7%) for the physicians.

Figure (6) showed the physicians' knowledge about the Nation' Regulations of telemedicine usage to deliver clinical services, and revealed that more than half of the participating physicians, and medical students have the knowledge about the regulations of telemedicine that included in the Egyptian Medical Syndicate (58.9%), and the remaining percentage of the participant don't have this knowledge (51.1%).

Figure (7) showed the patients' trustiness for receiving medical services through telemedicine, and revealed that 80.6% of

patients prefer sending their medical questions from their personal account while 29.4 prefer sending the medical questions from a vague account , 69.9% of patients don't prefer asking their question on the public pages, and prefer sending their question on the private account of the physician ,84.1% of patients are satisfied by sending reports of examination, and investigations to the physician account through telemedicine .

Figure (8) showed the assessment of the patients' satisfaction with medical services associated with telemedicine during COVID-19 pandemic, and revealed that a great majority of the participants (78.6%) are satisfied with the service while only (21.4%) are not satisfied they expressed (it was inadequate).

Figure (9) showed the physicians' measures for best practice of telemedicine, and revealed that the physicians were trying many measures for best medical practice through telemedicine in the form of keeping physician-patient boundaries, time control, and asking for the reports of the investigations (79.5%, 67.6%, and 81.5%) respectively.

**Table (1): Demographic characteristics of the participating physicians**

	Number (n=526)	Percentage (%)
<b>Age ( years)</b>		
18- >30	200	37.9
30- >50	314	59.8
≥ 50	12	2.3
<b>Sex</b>		
Male	149	28.2
Female	377	71.8
<b>Residence</b>		
Upper Egypt	372	70.7
Lower Egypt	154	29.3
<b>Educational level</b>		
Student at academic years	89	17
Student at clinical years	44	8.3
House office	72	13.7
Resident	60	11.4
Specialist	195	37.1
Consultant	66	12.5



**Table (2): Demographic characteristics of the participating telemedicine recipients**

Variable	Number (n=456)	Percentage (%)
<b>Age ( years)</b>		
18- >30	208	45.6
30- >50	228	50
≥50	20	4.4
<b>Sex</b>		
Male	133	29.2
Female	323	70.8
<b>Residence</b>		
Upper Egypt	420	92.1
Lower Egypt	36	7.9
<b>Educational level</b>		
University education	246	53.9
Post graduated education	180	39.5
Below secondary education	30	6.6

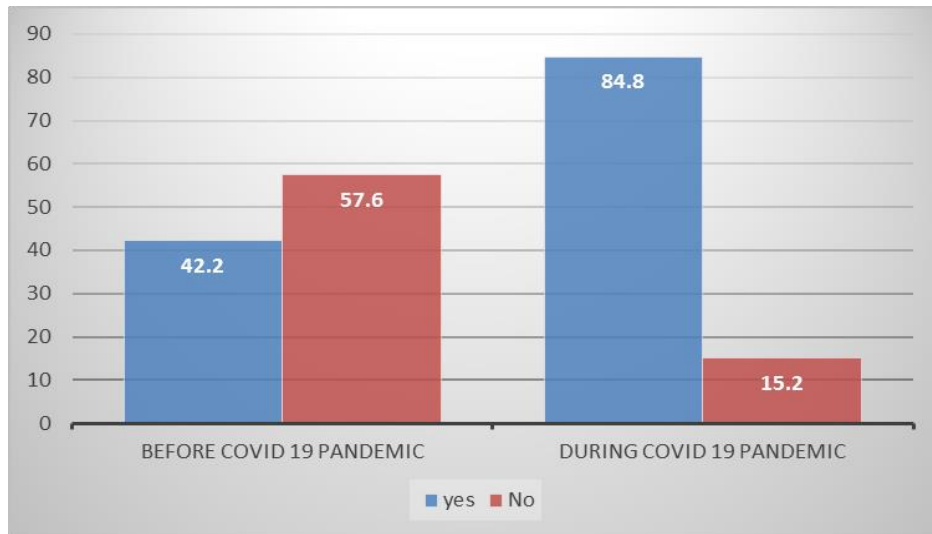
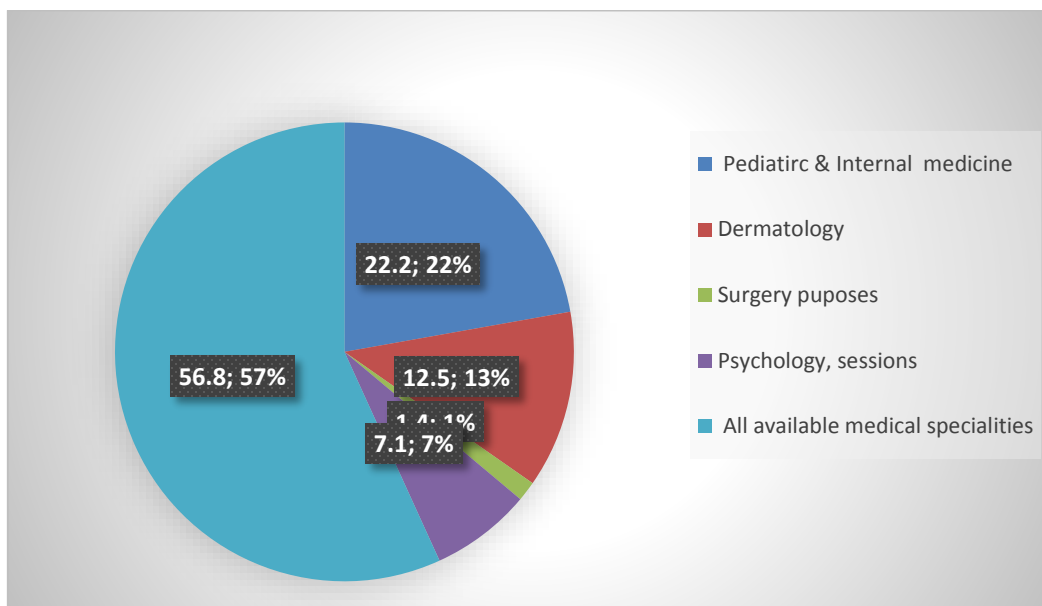


Figure (1): The extent of telemedicine usage before and during COVID-19 pandemic



\*All specialties = All above mentioned specialties

Figure (2): The frequency of the preferred specialties in telemedicine services from the participants' point of view

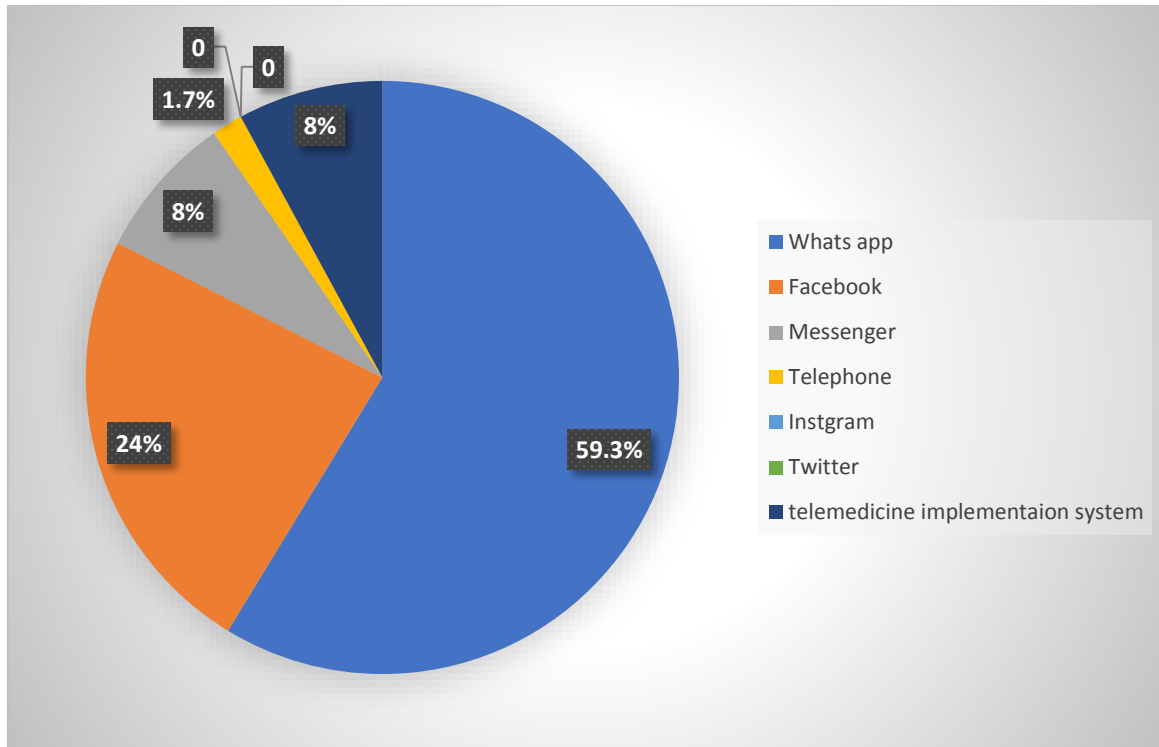


Figure (3): The frequency of social media applications used in the telemedicine services

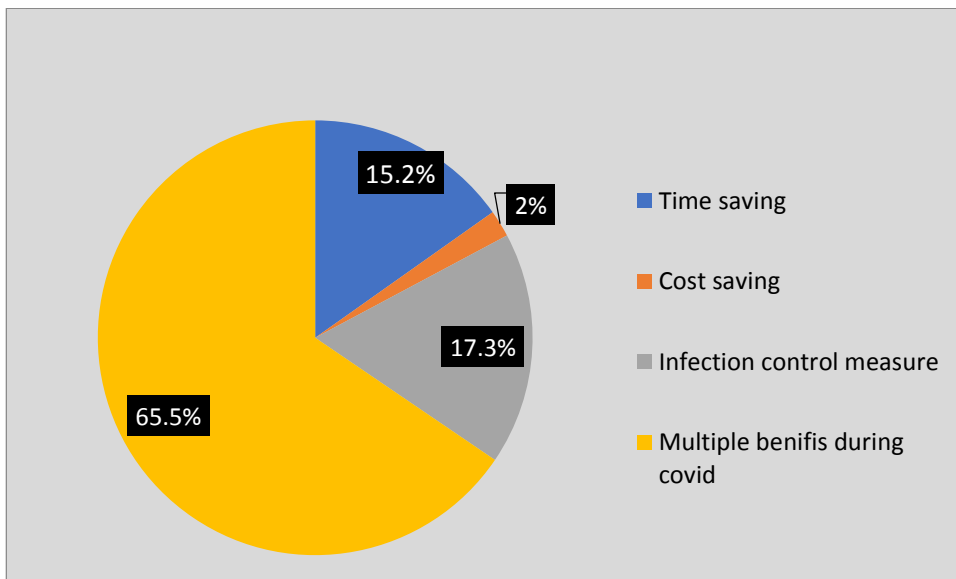


Figure (4): Benefit assessment of telemedicine for the community during the COVID -19 pandemic

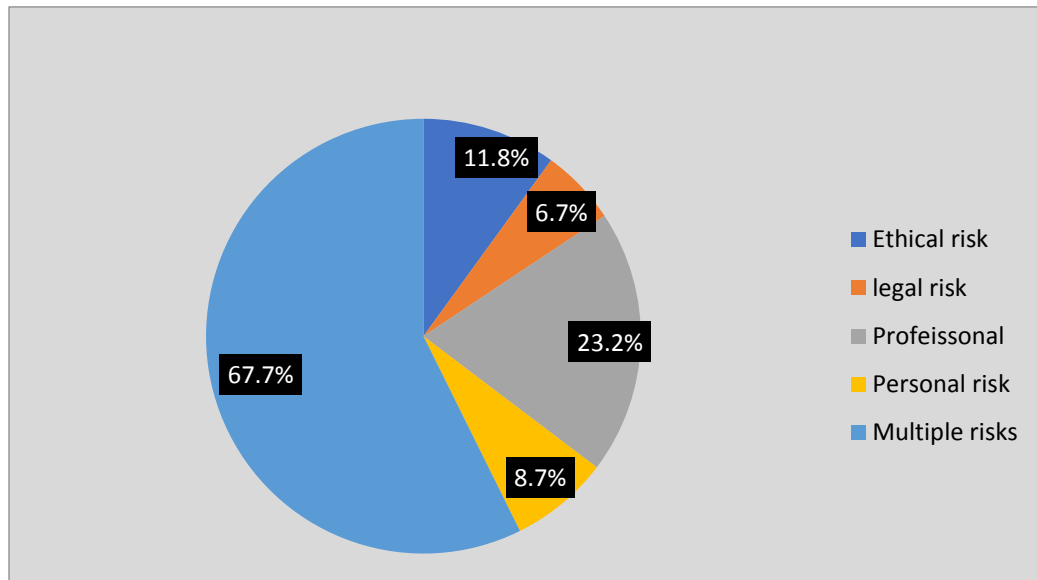


Figure (5): Risk Assessment for the physicians in providing telemedicine services

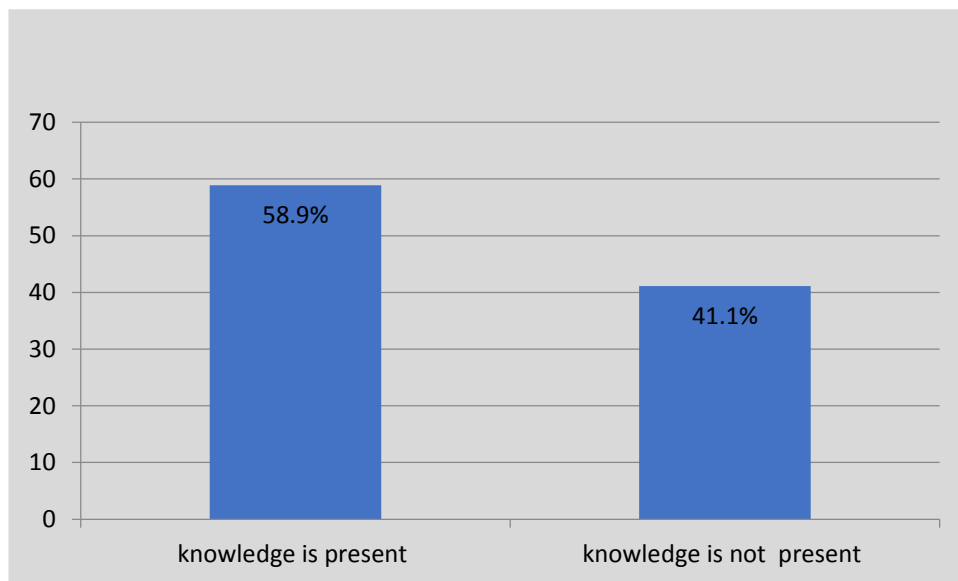


Figure (6): Physicians' knowledge about the Nation's Regulations of telemedicine usage to deliver clinical services

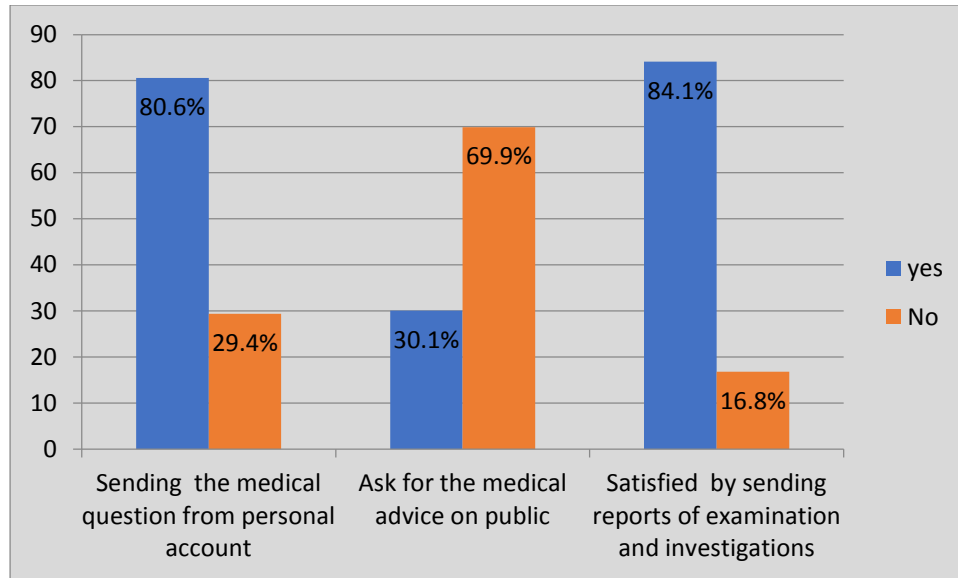


Figure (7): The patients’ trustiness for receiving medical services through telemedicine

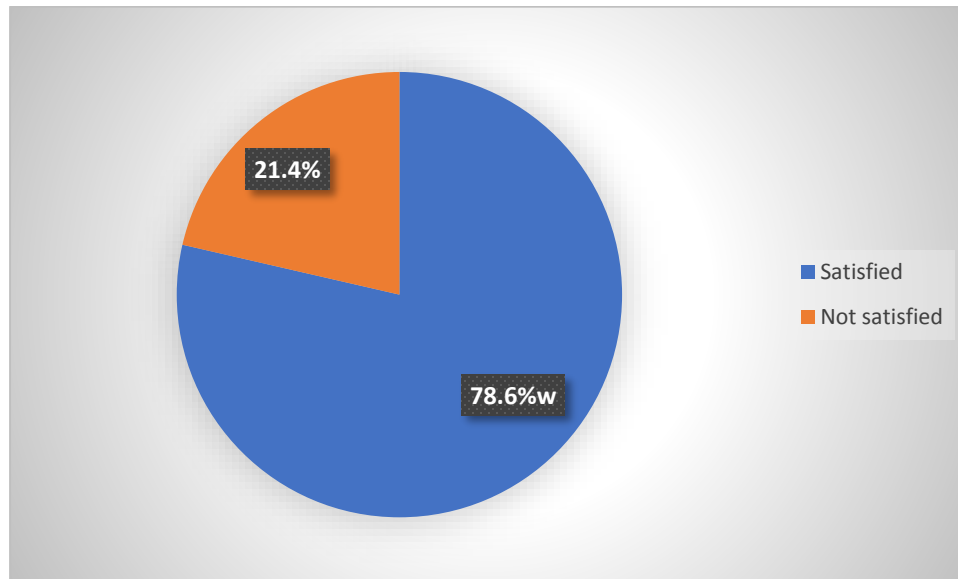


Figure (8): Telemedicine recipients’ satisfaction about medical services associated with telemedicine during the COVID 19 Pandemic

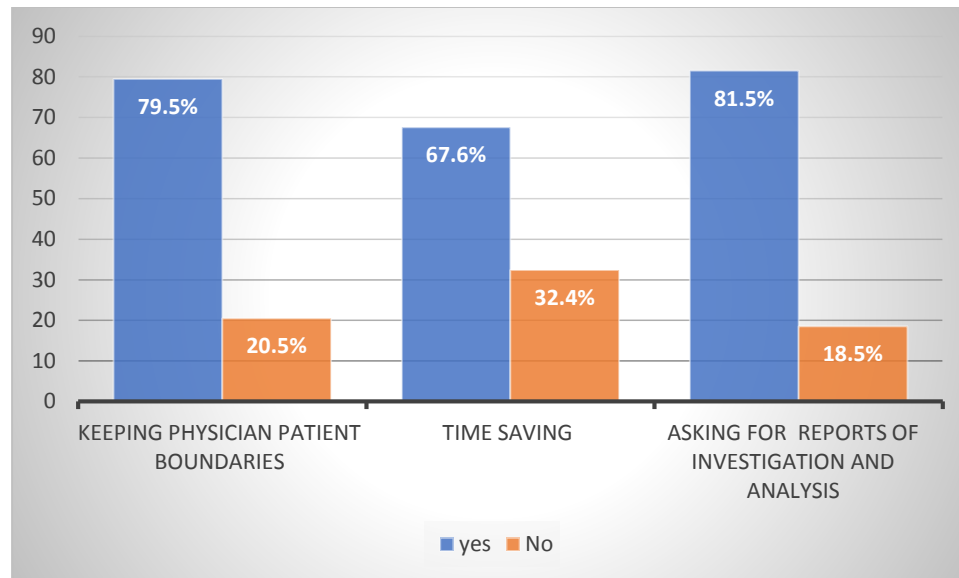


Figure (9): The physicians' measures for best practice of telemedicine

#### IV. DISCUSSION

Telemedicine or telehealth is an ideal integrating management of numerous challenges facing healthcare systems in response to the global COVID-19 outbreak (*Onder et al., 2020*). Telemedicine has emerged as a serious technology to provide medical care to patients while seeking to reduce COVID-19 virus transmission among patients, families, and clinicians. It is also increasingly necessary to preserve scarce personal protective equipment (*Calton et al., 2019*). The point of interest in the current study is the direct contact of the physician with the patients through telemedicine that can be distinguished from other largely unregulated telehealth activities like the creation of an electronic health care record and the provision of general health and treatment-

related information (which is directed to general populations) through electronic media (*Dunn, 2004*). Challenges regarding physicians' engagement in providing health care services through telemedicine professionally will continuously increase, the benefits and risks of physician participation in telemedicine should be explained, and continues recommendations for the physicians to prevent any medico-legal concerns related with these nontraditional forms of patient-physician interactions (*Abodunrin & Akande, 2009*).

Regarding the extent of telemedicine usage before and during COVID –19 Pandemic; the current study revealed that about half of the participants were using telemedicine before the beginning of this outbreak, as telemedicine in

the last years used to bring specialty-palliative care at home for the seriously ill patients and their families (*Calton et al., 2019*), this number is doubled with the emergence of COVID-19 outbreak, telemedicine has been catapulted into the role of a critically essential service to help mitigation of COVID-19 extent and preserve valued personal protective equipment (**Ji et al., 2020**).

**Ji et al. (2020)** summarize the important services of telemedicine during COVID-19 Pandemic as follow:

- Providing an enabled outbreak alert and response network through focusing on the exposure concerns and clinical diagnostic measures so can mitigate and prevent overcrowding in emergency units and urgent care departments, with providing adequate reassurance and guidance.
- Operating in a synchronized mode to deliver effective care services to address the needs of low-acuity COVID-19 patients so contribute to combat the crisis outbreak.
- Addressing the ongoing healthcare needs of other non-corona diseases for reduction of in-person clinic visits so prevent and reduce unsafe human contacts with COVID-19 cases and healthcare workers so can support members in social isolation and avoid COVID-19 virus exposure for members and their physicians,

therefore reduce the burden on the healthcare systems.

Regarding the benefit assessment of telemedicine during the COVID-19; more than half of the participants expressed their usage of telemedicine during this period is a multi-benefits service (social distancing & infection control measure, time-saving service, and cost-saving service) as patients who receive health services by telemedicine are considerably satisfied with the accessibility and time-saving benefit (**Calton et al., 2019**). In addition to its benefits in social distancing and infection control measure (**Ji et al., 2020**). Inadequate studies reported the use of E-Health applications for home monitoring has been demonstrated to improve the quality of care in persons with cardiovascular diseases (**Marzano et al., 2015**).

Concerning risk assessment for the physicians associated with telemedicine, about two thirds of the physicians expressed the presence of multiple risks (Ethical, Legal, Professional, Personal) associated with providing the health care services by this process, DeCamp (2013) revealed through his study that healthcare providers requiring to deliver clinical services through telemedicine but greatly faced myriad ethical, legal and regulatory conflicts. Recently within the last few months of the outbreak, many telemedicine regulatory measures are being relaxed to support

these changes and many countries developed laws and regulations to facilitate more widespread use of telemedicine (**Dario et al., 2004**).

Regarding the physicians' knowledge about the Nation' Regulations of telemedicine usage to deliver clinical services, that more than half of the participant physicians have the knowledge about the regulations of telemedicine that included in the Egyptian Medical Syndicate, but still to some extent their knowledge cannot save them from the challenges regarding physicians' engagement in providing health care services through telemedicine that professionally will continuously increase. Issues about the benefits and risks of physician participation in telemedicine should be explained and continues recommendations for the physicians to avoid any medico-legal concerns associated with these nontraditional forms of patient-physician interactions (**DeCamp, 2013**).

The patients' trustiness in telemedicine for receiving medical services is great, that explained by the preference of sending their medical problems from their personal account but don't prefer asking their question on public pages and prefer sending their question on the private account of the physician, this means great trustiness in the physician-patient relationship with the requirement to keep their

health information secure from the public. Great numbers of the patients were satisfied with sending reports of examination and investigations to the physician account through telemedicine for best medical practice in good diagnosis and online medical advisement and prescription.

Most of the participants were satisfied with the medical services associated with telemedicine during COVID-19 Pandemic, this is coinciding with **Robinson et al. (2015)**, who reported through large scale surveys; patient satisfaction regarding the usage of telemedicine has been increasingly positive as technology has made the activities of daily living easier and more efficient but still, some patients and populations were not adequately satisfied. There are certain barriers causing this non-satisfaction associated with telemedicine as age-based differences in comfort and knowledge with modern technology in addition internet access differences exist between urban and rural areas (**Greenberg et al., 2018**).

The study reported many measures which the physicians tried for best medical practice through telemedicine in the form of keeping physician-patient boundaries, time control and asking for the reports of the investigations. National organizations in some countries like USA, Canada, United Kingdom, and other countries in attempts to regulate the



process of telemedicine, have been issued guidelines on telemedicine and professionalism hopeful to realize social media's benefits and lessening inherent ethical risks (DeCamp, 2013).

### Strengths and Limitations of the study

Descriptive research generally can provide an in-depth view of any topic we might want to study, and the level of detail in descriptive research is extremely valuable. This type of research can be used to create new research questions, or form hypotheses about cause and effect relationships. Limitations of the study were a single-institution study so it cannot be generalized to all institutions, the use of social media in medicine was evaluated as a whole; therefore, and other applications of social media have not been considered here.

### V. CONCLUSION

Health emergencies, such as COVID-19 outbreak, place pressure on health systems, physicians, and their ability to provide health care services. Telemedicine can improve medical practice and patient care in ways that we can all feel secure by maintaining a solid patient-doctor connection, respecting patient privacy, promoting equity in access and

treatment, and achieving the best possible outcomes.

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## التحديات الأخلاقية و المهنية لاستخدام الطب عن بعد في تقديم خدمات الرعاية الصحية أثناء جائحة

### كوفيد-19

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أسيوط

تُعد منصات الطب عن بُعد مثالية لإدارة العديد من التحديات التي تواجه أنظمة الرعاية الصحية استجابةً لنفسي الأمراض المعدية عالمياً مثل جائحه كوفيد\_19 ، ولكن الاستخدام غير المنضبط للطب عن بعد قد يرتبط بحدوث مخاطر أخلاقية وقانونية في نطاق الصحة. الهدف من الدراسة: تقييم مدى وأغراض زيادة خدمات الطب عن بعد خلال جائحه كوفيد\_19 بين الأطباء في محافظات مصر لتقييم التحديات الأخلاقية والقانونية والمهنية المستمرة المرتبطة بها. الدراسة عبارة عن دراسة مقطعية قائمة على الاستبيان تتكون من قسمين تصممين لتقييم مدى وأغراض الطب عن بعد فيما يتعلق بالخدمات الصحية في فترة جائحه كوفيد\_19 مع قياس مدى وعي الجمهور بطلب المشورة الطبية عن بعد ، وتقييم تنفيذ المعايير المهنية والأخلاقية لهذه العملية والمخاطر الأخلاقية والمهنية المرتبطة بالطب عن بُعد. النتائج: (84.8%) من المشاركين يفضلون استخدام التطبيب عن بعد خلال فترة انتشار جائحة كوفيد\_19 ، معظم المشاركين راضون عن استخدامهم للتطبيب عن بعد وخاصة تطبيق الواتس اب ، وقد عبرت الغالبية العظمى من الأطباء (67.7%) عن وجود مخاطر متعددة (أخلاقية ، قانونية ، مهنية ، شخصية) مرتبطة بتقديم خدمات الرعاية الصحية من خلال هذه العملية. الغالبية العظمى من المشاركين (78.6%) راضون عن الخلاصة: يوفر التطبيب عن بعد خدمات صحية رائعة عن بُعد أثناء جائحة كوفيد\_19 ، ولكنه يحمل أيضاً الخدمة مخاطر على مستوى الجوانب الأخلاقية والقانونية والشخصية والمهنية. يجب على الأطباء وطلاب الطب الذين يستخدمون التطبيب عن بعد الانتباه إلى الحساسية الأخلاقية في علاقاتهم مع المرضى.