

Pros and cons of telemedicine in diagnosis and management: A cross sectional survey

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ABSTRACT

Introduction: Cost effectiveness, equity, and quality all are problems facing the health care services in both developed and developing countries. Modern technologies as telemedicine tried to help population especially in epidemics. Many malpractice problems facing doctors and other health care workers due to using telemedicine. This study aimed to clarify the pros and cons of telemedicine.

Method: Survey was done and validated to health care worker sectors, patients and judicial workers sectors, to evaluate the telemedicine according to their practice.

Results: about one thousand volunteers shared in this study, 616 (61.3%), 68 (6.8%) judicial workers, and 320 (31.9%) other jobs. Most of doctors 95% of them refuse to use telemedicine in the provisional diagnosis, 77.3% claim that it is very difficult to give accurate diagnosis through media, 75.6% of them convinced that telemedicine and increase the malpractice issues and medical responsibilities. In judicial workers 64.7% of them prove that there is increase in malpractice issues due to use of media. On the other side 55% of the other job sectors agree with the use of telemedicine especially in time of epidemics.

Conclusion: Telemedicine has many pros and cons. The main cons were that the inability to give the actual diagnosis and occurrence of medical errors, while the main pros was that the use of telemedicine to follow up already diagnosed patient. Governments should legalize the using of telemedicine by enacting law that prohibit the use of it except between doctors to take medical decision or exchange opinion.

Keywords: telemedicine, health care workers, judicial workers

INTRODUCTION

Telemedicine means usage of technology in healthcare to enable healing at a distance [1-4]. Telemedicine promotes long-distance education, training, clinical care, and healthcare [2, 5-7]. Telemedicine provides three services:

1. specialized telemedicine,
2. teleassistance, and
3. telehealthcare [8].

Telemedicine has many advantages especially in time of pandemics for both doctors and patients including safety of physicians and patients, low cost, and easily accessibility [8, 9].

Although, telemedicine can provide healthcare services in medically uncovered areas, general practitioners do not want to change their practice and desire to keep their “doctor-patient” relationship [10]. In supporting health care system, telemedicine includes online consultations different forms,

telemonitoring/screening, sensors, and chatbots for connecting at-risk patients to a doctor and suggestions [9].

Pandemics especially COVID-19 has radically changed the medical team thoughts about the telemedicine. It can decrease the exposure of the medical team to infection [11] and expected by some of the medical team to be very beneficial if done in good and legal manner. Telemedicine provides better follow-up of patients and better healthcare services to the masses [12]. Telemedicine during COVID-19 pandemic allows the doctors to keep social distancing, slow the spread of virus, and provide services by videoconferencing or phone for mild cases with limited supplies to urgent cases [9].

Although, telemedicine has many advantages, it has many disadvantages and medicolegal problems, breakdown in the relationship between medical teams and patients [13], misdiagnosis or wrong treatment. There are many legal and ethical aspects of telemedicine. These include the medical responsibilities, the confidentiality and privacy of the patients cannot be maintained, and the jurisdictional problems [14]. Shortage of medical practitioners and specialists, shortage of

Table 1. Demographic data and work distribution of the participants

| Variables | Number | Percent | Total | |
|--------------------------|---------------------------|---------------------------|-------------|-------------|
| Sex distribution | Male | 408 | 40.6% | |
| | Female | 596 | 59.4% | |
| Age distribution | 18-30 | 540 | 53.8% | |
| | 31-40 | 160 | 15.9% | |
| | 41-50 | 166 | 16.5% | |
| | 51-59 | 106 | 10.6% | |
| | ≥60 | 32 | 3.2% | |
| Work distribution | Physicians | 356 (57.8%) | | |
| | Medical students | 182 (29.5%) | | |
| | Medical sectors | Pharmacist | 30 (4.9%) | 616 (61.3%) |
| | Dentist | 28 (4.5%) | | |
| | Nurses | 20 (3.3%) | | |
| | Lawyer | 18 (26.4%) | | |
| | Law sectors | Judge | 14 (20.6%) | 68 (6.8%) |
| | | Legal affair | 8 (11.8%) | |
| | | Policeman | 8 (11.8%) | |
| | | Student in Faculty of Law | 20 (29.4%) | |
| Others | Illiterate | 8 (2.5%) | 320 (31.9%) | |
| | Medium level of education | 16 (5%) | | |
| | Student | 130 (40.6%) | | |
| | High education | 106 (33.1%) | | |
| | Master or Doctoral degree | 60 (18.8%) | | |

internet facilities, low education levels in some patients all are problems facing the telemedicine in developing countries [1]. The evolution of telemedicine has several legal problems ranging from the authorization to the protection of patient confidentiality [8].

To the best of our knowledge no study clarifies the role of telemedicine in Egypt, and if it has a share hand or the upper hand if compared with traditional medicine.

Aims of the Current Study

1. To provide an overview about the pros and cons of the telemedicine in Egypt especially in the period of the COVID-19 pandemic.
2. To assess the impact of telehealth on clinical outcomes from the view of the doctors and patients.
3. To evaluate opinion of law and malpractice problems that can face doctors due to use of telemedicine.

MATERIAL AND METHOD

A survey was performed and spread in the form of personal link, all who shared in the survey was volunteers. The study was done through a period of six months began in September 2020. The survey was spread to all types of volunteers, physicians, dentist, nurses, lawyers, judge, other jobs, and students from all faculties. The survey consisted of three close ended questions for all volunteers, followed by eleven close ended questions for health care workers, seven close ended questions for law people, and nine close ended questions for the other jobs and students, all questions in the form of multiple choice, some of them can choose multiple responses. The first three questions included a demographic section to better understand the background characteristics of the respondents, this followed by specific questions for all groups about the duration of work, experience in telemedicine and their opinion in it, malpractice or problems occurred due to the use of the telemedicine. Prior to dissemination, the survey was piloted among two physicians, two lawyers and three from

other jobs to improve the accuracy of it. The survey was approved from the Ethical committee Assiut University– Faculty of Medicine and registered in the clinical trials.gov (NCT04752553). Validation and revision of the questions were done to be in Arabic and English to adapt all the volunteers. The survey responses were collected and analyzed using the SPSS version 20 program. Mixed methods approach was used to analyze the survey include the descriptive statistics, frequency analysis and qualitative approach.

RESULTS

The volunteers who actively shared in the survey was 1,004 classified according to their jobs, as follows (616 health care workers 61.3%, 68 law sectors 6.8%, and 320 other jobs 31.9%). Classified according to sex, as follows (408 male 40.6% and 596 female 59.4%). Age distribution of the volunteers was, as follows: the age group 18-30 years was the largest one 540 (53.8%) followed by the age group 41-50 years was 166 (16.5%) as shown in **Table 1**. The work distribution of each sector was shown in **Table 1**, all levels of education were presented in the same table to know the difference in their view to the telemedicine.

There was a wide range of medical specialties represented in the survey participants. The specialties which represented in **Table 2** were 35 different specialties, in addition to dentist 28 (4.5%), nurses 20 (3.2%), pharmacist 15 (2.4%), clinical pharmacy 15 (2.4%), and veterinary doctors 10 (1.6%). The largest group was the medical students 182 (29.5%), general practitioners 61 (9.9%) followed by dermatologist 35 (5.7%). This large scale of specialty can give a good idea about the use of the telemedicine among different specialties and the pros and cons of the use of telemedicine among doctors.

Table 3 shows that the duration of the health care workers who shared in the study, the highest percent was for those who works less than 1 year 230 (37.3%), followed by those work 20-29 years 122 (19.8%).

Table 2. Distribution of doctors according to the specialty

| Specialty | Number | % | Specialty | Number | % |
|------------------------|--------|------|--------------------|--------|-----|
| Medical student | 182 | 29.5 | Obstetrics | 21 | 3.4 |
| General practitioner | 61 | 9.9 | Neurosurgery | 13 | 2.1 |
| Dermatology | 35 | 5.7 | Andrology | 6 | 1.0 |
| cardiology | 3 | 0.5 | Anesthesia | 11 | 1.8 |
| Pediatric | 12 | 1.9 | Critical care | 4 | 0.6 |
| Cardiothoracic surgery | 7 | 1.1 | Vascular surgery | 3 | 0.5 |
| Clinical pathology | 25 | 4.1 | Psychiatry | 7 | 1.1 |
| Plastic surgery | 6 | 1.0 | Radiology | 4 | 0.6 |
| Urology | 6 | 1.0 | ENT | 7 | 1.1 |
| Gastroenterology | 10 | 1.6 | Dentist | 28 | 4.5 |
| General surgery | 10 | 1.6 | Pathology | 4 | 0.6 |
| Rheumatology | 2 | 0.3 | Biochemistry | 5 | 0.8 |
| Oncology | 8 | 1.3 | Parasitology | 1 | 0.2 |
| Hematology | 4 | 0.6 | Microbiology | 7 | 1.1 |
| Forensic medicine | 7 | 1.1 | Community medicine | 5 | 0.8 |
| Chest | 11 | 1.8 | Nurses | 20 | 3.2 |
| Orthopedics | 3 | 0.5 | Pharmacist | 15 | 2.4 |
| Internal medicine | 14 | 2.3 | Clinical pharmacy | 15 | 2.4 |
| Neurology | 15 | 2.4 | Veterinary | 10 | 1.6 |
| Family medicine | 8 | 1.3 | Quarantine | 1 | 0.2 |
| Total | | | 616 | | |

Table 3. Duration of work of the health care workers

| Years | Number | Percent |
|--------------------|------------|---------|
| < 1 year | 230 | 37.3 |
| 1-<5 years | 66 | 10.7 |
| 5-<10 years | 52 | 8.4 |
| 10- < 20 years | 102 | 16.6 |
| 20 < 30 years | 122 | 19.8 |
| More than 30 years | 44 | 7.2 |
| Total | 616 | |

Table 4. Pros and cons of using telemedicine from medical staff view

| Pros | No. | % | Cons | No. | % |
|--|-----|------|---|-----|------|
| The ability to help patients in remote and remote areas | 404 | 65.6 | The lack of means of communication via the Internet in some remote areas and villages | 322 | 52.3 |
| Reducing the number of patients who travel abroad for the purpose of treatment | 238 | 38.6 | The inability of the patient to describe the disease through remote communication | 364 | 59.1 |
| Exchanging opinions and experiences about patients' cases with consultants who are outside the country or in remote areas inside the country | 396 | 64.3 | The doctor's inability to diagnose the condition accurately | 442 | 71.8 |
| Follow up of chronic disease cases in a more committed manner | 362 | 58.8 | Inability of the doctor to see the patient and conduct an examination | 476 | 77.3 |
| The ability to work and see patients from home or from another place outside the hospital or clinic | 196 | 31.8 | The doctor's inability to perform surgeries | 372 | 60.4 |
| The possibility of reaching a larger number of patients | 254 | 41.2 | Inability to maintain patient privacy | 176 | 28.5 |
| Distance medical education | 246 | 39.9 | Language /cultural considerations | 224 | 36.4 |
| Not to transmit the infection during the outbreak of the coronavirus | 398 | 64.6 | | | |
| Reducing the cost to the patient | 278 | 45.1 | | | |

In **Table 4**, aspects of the telemedicine according to the health care worker's view are displayed. They informed that there are many pros and cons for the use of telemedicine among the Egyptian patients, they conclude the cons as follow: the most important that inability of doctors see patients and conduct examination (77.3%), inability to diagnose the condition accurately (71.8%), inability to perform surgeries or any maneuver (60.4%), inability of patients to describe the symptoms through the remote communications (59.1%), lack of communications facilities and internet (52.3%), language and cultural considerations (36.4%), and lastly inability to maintain the privacy of the patients (28.5%).

Also, health care workers reported some of the pros of the telemedicine like the ability to help patients in remote areas (65.6%), prevent or decrease the spread of infections in pandemic times (64.6%), exchanging opinions and consultations between doctors (64.3%), follow up of chronic diseases (58.8%), reducing the cost of travel and fees for patients (45.1%), these followed by reaching large number of patients, reducing the travel of patients, and ability to follow up patients outside hospitals and clinics (41.2%, 38.6%, 31.8%, respectively).

Table 5. Opinion of the other jobs sectors about communication with doctors through telemedicine

| Variables | | No | % |
|--|-----|------------|------|
| Do you prefer to be in direct contact with doctors? | Yes | 180 | 56.2 |
| | No | 140 | 43.8 |
| Is it better for you to take medication through phone or media | Yes | 174 | 54.3 |
| | No | 146 | 45.7 |
| Why do you communicate with doctors through media (telemedicine)? | | | |
| Decrease cost of travel and doctor fees | | 78 | 24.4 |
| Decrease the transmission of disease especially in pandemics | | 148 | 46.3 |
| I do not like to go to doctors | | 94 | 29.3 |
| Total | | 320 | |

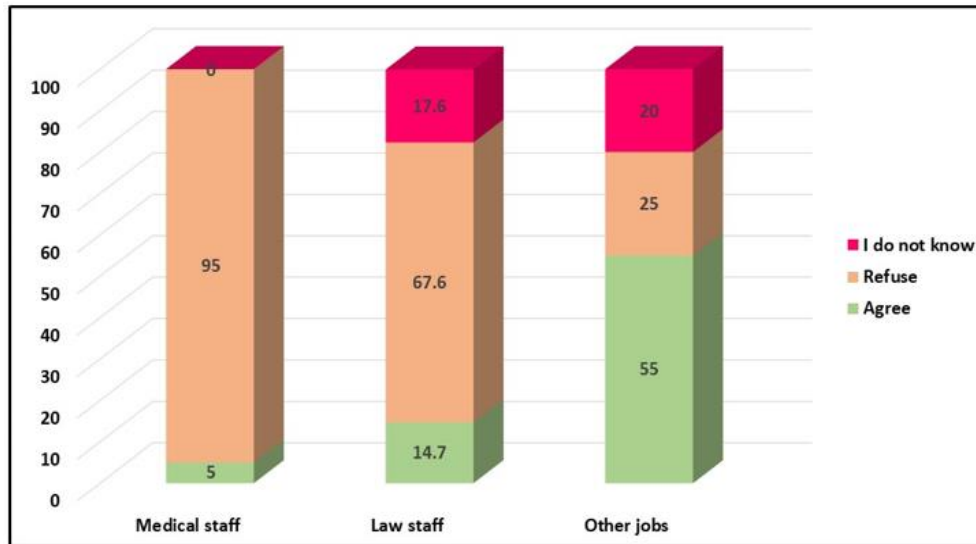


Figure 1. What about the initial consultation being through media?

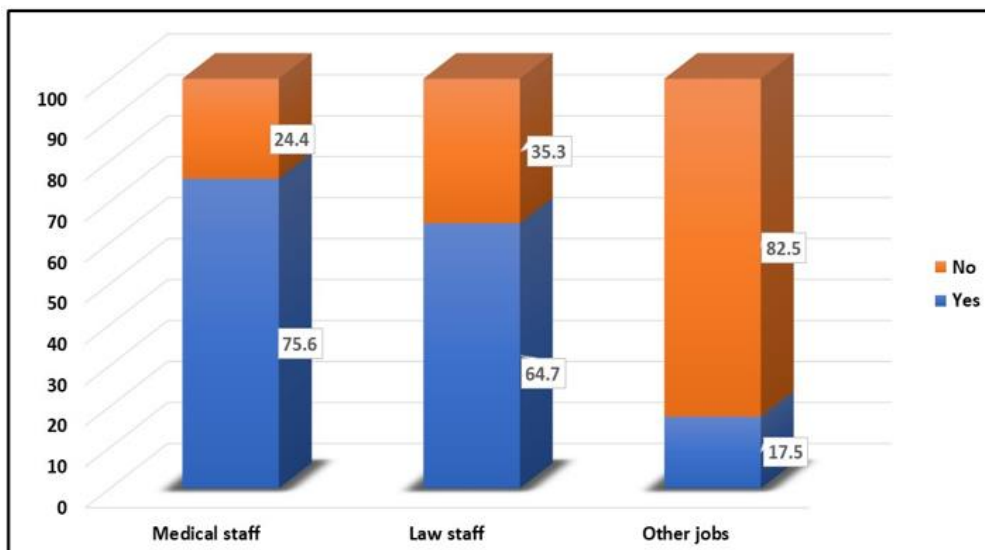


Figure 2. Can media increase the number of medical responsibilities issues in courts?

Table 5 shows that the opinion of the other job sectors about communication with doctors through telemedicine, most of them prefer the telemedicine due to decrease the transmission of the disease especially in the pandemic times (64.3%), and some (24.4%) prefer that due to decrease the cost of the travel and doctors' fees.

In **Figure 1**, the opinion of all sectors, health care workers, law sectors and other jobs, in using the telemedicine in initial consultations 95% of the health care workers refuse that,

67.6% of law sectors refuse, while only 25% of the other jobs refuse the telemedicine in initial consultations and 55% of them agree with that.

Figure 2 explains the refusal of doctors and law sectors that the telemedicine can increase the medical responsibilities in courts, 75.6% of the health care workers agree with that, 64.7% of law staff found that the telemedicine can increase the malpractice and medical responsibilities issues in court, while in the other jobs only 17.5% agree with that.

DISCUSSION

There are a lot of concerns regarding the legal and ethical aspects of using telemedicine, including the responsibilities, confidentiality, and jurisdictional problems. This study tried to know the vision of doctors, patients and judicial workers towards the telemedicine and its use in Egypt especially after the world pandemic of COVID-19 and fear from spread of infection. 1,004 volunteers shared their opinion about telemedicine in the study, 616 was doctors (61.3%) from different specialties and different work duration, judicial workers 68 (6.8%), and other people who considered as exposed to or tried to use telemedicine 320 (31.9%). Most of doctors refuse the use of telemedicine despite their conviction that there are pros for it. Doctors who refuse the telemedicine conclude the disadvantages of telemedicine in that inability to reach the diagnosis (71.8%), inability to perform examination (77.3%), lack of good communication with patients (52.3%), language and cultural considerations (36.4%), and inability to perform even small maneuvers (60.4%). Ninety and five percent of doctors refuse even initial consultations through telemedicine and 75.6% of them accept that telemedicine and increase the malpractice and medical responsibility issues. 67.6% of judicial workers refuse the use of telemedicine and about 64.7% of them accept that telemedicine increases the medical errors and malpractice issues. Patients' opinion was differing from that of doctors and judicial workers and about 56.2% of them prefer the use of telemedicine with their doctors especially in pandemic times (55%), because it decrease the transmission of disease (46.3%), decrease the cost of travel (29.3%). It was proved that the teleconsultant came with the increase the risk of malpractice problems [15]. The risks, safety, legal implications, and liability of involved stakeholders proved that patients are more willing to use telemedicine for home care and day by day self-management [16]. This can increase their compliance and may increase the legal issues for doctors. The medical legal aspects of telemedicine in Italy found that evolution of telemedicine poses a series of legal problems especially that broken the confidentiality [8]. The researchers insist upon that telemedicine should not replace the traditional health services but can integrate to improve the effectiveness and efficiency [8]. In [17], the researchers, study about the medical and legal aspects of telemedicine in ophthalmology, found that telemedicine may facilitate the access of patients to higher healthcare, but ethical and legal issues are barriers for the wide using of it. The systemic review about the ethical principles of telehealth found that there are small number of studies identified the ethics associated with telehealth and their impact on the community [18]. Ethical issues in telemedicine including the autonomy, patient doctor relationship, non-maleficence, and beneficence are so important to be studied before going on using telemedicine. Comparative study was also done [19] to compare between the telemedicine ethics guidelines AMA (American Medical Association), WMA (The World Medical Association), and the HPCSA (The Health Professions Council of South Africa). It was found that there is a gap between these guidelines and the practitioner perspectives, this gap is due to variability in the international practice, and the complexity of patient provider interactions. There is a big need to close this gap between the guidelines. In [20], the researchers in their study about the population interest in telehealth in United States (US) during the pandemic of COVID-19 found that increase the cases of

COVID-19 lead to increase in the using of telehealth among the US population. Telecommunication infrastructure in hospitals lack the capability to communicate with this number of populations. Sure, this may lead to malpractice and can lead to dissatisfaction of the patients.

CONCLUSION

The transition from traditional medicine to telemedicine is so rapid due to the presence of pandemic, fear from infection, and fear from being in hospitals or clinics. Despite the presence of many benefits for using telemedicine for doctors and patients but this may increase the legal issues in front of court due to misdiagnosis, or wrong treatment. Guidelines for using telemedicine should be performed by the health care providers to saving patients and doctors from the malpractice and legal issues. Governments should legalize the using of telemedicine by enacting law that prohibit the use of it except between doctors to take medical decision or exchange opinion.

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