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The Egyptian Transition towards Telemedicine during the COVID-19 Pandemic: Cross-Sectional Survey

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Abstract

Purpose: Telemedicine is representing the future of medical services. It shows many advantages and promising opportunities. It has been tried in different medical specialties. The COVID-19 pandemic has enhanced the establishment of telemedicine services worldwide. Low and middle income countries such as Egypt are still new to these technologies. The purpose of this study is to provide a snapshot data on the current situation in Egypt and assess its transition towards more integrated telemedicine services from the physicians' perspective.

Methodology: This is a cross sectional survey through Online and offline questionnaire filled out by cardiologists selected randomly from different institutions in Egypt asking about their experience on the telemedicine (TM) services in Egypt. The data was validated by two authors separately.

Findings: A total of 66 cardiology physicians have fully responded to the questionnaire on telemedicine in Egypt. Of the responding doctors, 57.6% said TM helped with emergent situations while 66.7% of them said lack of integrated assessment tools is a challenge hindering the transition towards TM in Egypt. The vast majority of doctors (95.5%) believe that the COVID-19 pandemic increased the usage of TM. Many physicians (77.3%) thought there should be guidelines and protocols to guide the online consultation process**.** Despite the fact this snapshot data has revealed that the Egyptian experience in TM service is far from the standard, it has showed that collaborative effort from all the stakeholders is mandatory. The COVID- 19 pandemic has enhanced the transition process, but some obstacles are still needed to overcome.

Recommendations: Further research on the TM in Egypt is required to provide clearer insights on the situation. New strategies to be developed by the Egyptian government and the leading medical institutions are needed. Appropriate training and payment to the health care providers for the medical services are needed. Finally, working on the internet infrastructure and public health awareness and usage of medical applications are key elements in developing the TM service.

Keywords: *Telemedicine, cardiology.*

Introduction

Technology has affected all the domains of the current life. It makes medical service easier, cheaper and more available (1). This includes medicine in particular with all the breakthroughs made in preventive, diagnostics, and therapeutic modalities (2) (3). It had made difference in the medical outcomes in critical and important situations including patients with Acute Myocardial Infarction (4). In addition to that, technology has formed new shape of the physician-patient relationship (5). From phone calls passing by social media platforms and reaching to organized online medical applications, the medical communication has radically changed during the past decade. COVID-19 pandemic has enhanced this process and revealed the need to more effective equipped systems for remote patient-physician communication (6).

In Egypt, the remote communication between the physician and his patients is not well structured or developed. In our study the physicians in a critical specialty- cardiology- were asked about their experience in remote medicine. This has helped us develop a preliminary understanding or mapping of the situation of Tele-medicine (TM) in Egypt. This includes the challenges they and their patients face, the advantages and disadvantages of TM, the process of patient evaluation and assessment and the impact of COVID-19 on that process. Additionally, the medico-legal and financial aspects have been discussed.

This study provides an insight about the situation of the usage of TM in Egypt especially during and after the COVID pandemic. It showed that the TM services in Egypt are based on individual initiatives mostly and lack standardization. It is facing some challenges such as the poor internet connectivity, shortage of organizing agencies and the under or non-payment of physicians for these services. However, this represents a great opportunity for investment in Egypt. Development of specific platforms and adoption of a national strategy by the governmental authorities for such service is fundamental. Finally, further research in Egypt is very crucial to provide more data.

Methods

It was conducted as a survey that has been distributed and filled by cardiologists in Egypt from different institutions. The data was collected in the period from July 2021 till November 2021. It was filled electronically and in a paper format. The physicians were randomly selected. The survey was sent to 200 physicians at different career levels including cardiology residents, cardiologists and cardiology consultants. One hundred and ten physician responded by filling the questionnaire. Only 66 of the responses have been validated to be complete and coherent. This validation process was done by two different authors to ensure not including uncompleted answers.

Results

The Current Situation in Egypt

The remote medical services are not integrated in the governmental medical services as 68.2% of participants indicated that their institutions provide no formal remote medical services. Most (72.7%) of the doctors reported that they received online/ phone consultations from people they know personally. Additionally, 15.2% received consultations from followers on social media platforms such as Facebook, Instagram or Twitter. Only 4.5% reported receiving formal consultation requests from official medical service mobile application. The most used methods of consultations were phone calls (78.8%) followed by Whatsapp messages (77.3%). Facebook posts

and messages came third with 16.7%. Almost all the doctors (90.9%) didn't have regular working hours for online consultations and received these requests throughout the day.

Table 1: TM exposure and communication channels

Question	Response	N (%)
Does your institution provide formal tele-medicine services?	Yes	21 (31.8%)
	No	45 (68.2%)
How often do you receive online/ phone requests for consultations?	< 5 per week	22 (33.3%)
	5-10 per week	25 (37.9%)
	10-20 per week	10 (15.2%)
	> 20 per week	9 (13.6%)
Most of the people who consult you online/ phone are?	Your patients from the clinic	33 (50.0%)
	Patients who know you personally (family, friends, others)	48 (72.7%)
	Followers on Facebook, Instagram or social media platforms.	10 (15.2%)
	Other	1 (1.5%)
Q3: How do patients contact you?	Phone calls	52 (78.8%)
	Text messages	5 (7.6%)
	Whatsapp messages	51 (77.3%)
	Facebook posts and messages	11 (16.7%)
	Official website/ application for medical services	3 (4.5%)

The Communication Process between the Physician and the Patient

The remote consultation was not of high quality as 48.5% of the doctors spent 5-10 minutes in average over phone assessing the patients' complaint. Around 88% said they review the patients' reports and laboratory results scanned images on Whatsapp. The doctors don't also examine the patient. They either send him to a nearby physician for assessment and report (51.5%) or order him basic investigations such as ECG, pulse oximetry or random blood sugar and recall (51.5%). This reduces the benefits of remote services to a far extent. Only 1.5% of physicians used online assessment tools. Most of the doctors (77.3%) send the patients Whatsapp messages with the instructions.

Table 2: Patient distant management

Question	Response	N (%)
How do you prescribe medications / order Labs in online/ phone consultations?	I send the patient a text message with instructions	9 (13. 6%)
	I send the patient a whatsapp message with instructions	51 (77.3%)
	I tell them to the patient and he write them down	11 (16.7%)
	I contact the pharmacy or the lab to order the investigations / medications	10 (15.2%)
	Other	3 (4.5%)
How do you clinically examine the patient?	I don't need to examine the patient	8 (12.1%)
	I send the patient to a nearby physician for assessment and report	34 (51.5%)
	I use online tools for assessment like built in stethoscope, pulse oximetry	1 (1.5%)

The Physicians' Perspectives towards the Service

Despite the low quality and non-organized way in which the remote consultation process was done, it have been proven to have many advantages. This included but not limited to saving time, saving effort and help in emergency situations. TM was time saving for 59.1% of doctors while 57.6% said it helped with emergent cases. Additionally, 28.8% of physicians said it allowed them to accept patients from different geographical areas. Roughly half of doctors (48.5%) believe they should be paid for the online or over phone consultations, while only 16.7% believed that the nonpayment to doctors is among the barriers towards effective remote medical service. TM should reduce patients' costs as 64.9% of the physicians believed that they should be paid less than the ordinary clinic visit. More than half of the doctors (54.5%) admitted they should be legally responsible for the patients with online consultation such as the ordinary ones.

Table 3: Physicians' perspective towards TM

Question	Response	N (%)
Q12: Would you accept the online consultation session to be recorded?	Yes	27 (40.9%)
	No	21 (31.8%)
	Maybe	18 (27.3%)
Q13: Are you paid for online/ phone consultation?	Yes	5 (7.6%)
	No	56 (84.8%)
	Sometimes	5 (7.6%)
Q14: You think you should be paid for online/ phone consultations?	Yes	32 (48.5%)
	No	9 (13.6%)
	Maybe	25 (37.9%)
Q15: If yes, how much you should be paid for online/ phone consultation?	The same as the ordinary clinic visit	15 (26.3%)
	Less than the ordinary clinic visit	37 (64.9%)
	More than the ordinary clinic visit	5 (8.8%)

Q16: Do you believe you are legally responsible for the patient with online consultation as the physical consultations?	Yes No Maybe	36 (54.5%) 13 (19.7%) 17 (25.8%)
Q18: What are the advantages of tele-medicine?	Save time Save effort Help in emergency situations Make more money for physicians Allows physicians to accept patients from remote places	39 (59.1%) 30 (45.5%) 38 (57.6%) 5 (7.6%) 19 (28.8%)

The Barriers and Opportunities towards Effective Remote Medical Services

Lack of medical assistive tools such as built in Stethoscope, Pulse Oximetry, EKG, and Echocardiography is a barrier to effective process of patient evaluation as declared by 66.7% of doctors. Less than half of the doctors (43.9%) believed that the low educational level of their patients is another barrier, While 19.7% of doctors answered that the poor internet connection is a barrier to the telemedicine. Various actions have been recommended by the physicians to improve this process. Online assessment tools are believed to help TM as 63.6% of doctors thought the availability of such tools would make remote medicine more effective. Additionally, 47.0% of physicians believed that the presence of organizing agencies to receive feedback and standardized process and money payment would make it more effective. A significant number of doctors (77.3%) believed that there should be guidelines and protocols to guide the online consultation process, while 48.5% of doctors declared that training on telemedicine for physicians would be very helpful.

Table 4: Challenges towards effective TM

Question	Response	N (%)
Q19: In your opinion, what is missing to make the tele-medicine more effective?	Online assessment tools (eg. built in stethoscope, BP measuring devices, EKG) Organizing agencies and systems to set time, feedback mechanism, payment methods, etc Better internet connection/ phone signals Physicians training on tele-medicine	42 (63.6%) 31 (47.0%) 15 (22.7%) 32 (48.5%)
Q20: Do you think online/ phone consultations are of the same quality as the regular physical consultations?	Yes, the same quality No, physical consultations are better No online consultations are better	4 (6.1%) 60 (90.9%) 2 (3.0%)
Q21: Would you recommend using tele-medicine in the future?	Yes No Maybe	34 (51.5%) 10 (15.2%) 22 (33.3%)

Q22: In your opinion, should there be guidelines and protocols for online consultations?	Yes No Maybe	51 (77.3%) 3 (4.5%) 12 (18.2%)
Q23: If yes, Would you require training on the new protocols for online consultations?	Yes No Maybe	51 (77.3%) 2 (3.0%) 13 (19.7%)

The Impact of COVID-19 on the Remote Medicine

Almost all doctors (95.5%) agree that the COVID-19 pandemic increased the usage of remote medicine and 92.4% believe that it would continue to increase after the pandemic. Physicians (74.2%) reported feeling safer providing remote medical services to patients during the pandemic.

Table 5: COVID-19 pandemic and TM

Question	Response	N (%)
Q24: In your opinion, Did COVID-19 pandemic increase the usage of tele-medicine?	Yes No Maybe	63 (95.5%) 0 (0.0%) 3 (4.5%)
Q25: After the COVID-19 pandemic, the tele-medicine usage would increase or decrease?	Increase Decrease	61 (92.4%) 5 (7.6%)
Q26: Do you feel safer in using Tele-medicine while serving patients during the COVID-19 pandemic?	Yes No Maybe	49 (74.2%) 4 (6.1%) 13 (19.7%)

Discussion

Telemedicine Worldwide

Telemedicine and remote medical services are now trending all over the world in many countries from Western to Eastern countries (2)(3). There have been many studies discussing this new service provided to patients. It has been invading all the specialties in Medicine and is not limited to a specific one.

Advantages of Remote Medical Services in Other Societies

Several advantages have been reported because of telemedicine (4)(5). In Northern Norway, it was found that videoconferencing with patients for orthopedic consultations saved money. This was after a certain number of cases per year to compensate for the logistical arrangements of telemedicine. This matches the results from our study where 59.1% of participating physicians reported TM to save their time and effort. It was also found to save effort of patients traveling to and from the hospitals (6). A meta-analysis of 6 RCTs and 6 cohort studies assessing a primary endpoint of wound healing in chronic patients with large number of patients including 3913 patients showed no significant difference in wound healing between patients receiving telemedicine and patients receiving the standard care with risk ratio [RR] 1.05, 95% CI 0.89-1.23; P=.15). Additionally, the risk of amputation in patients receiving telemedicine was lower than the other group of patients (RR 0.45, 95% CI 0.29-0.71; P=.001) (7). The cohort studies in the same

meta-analysis confirmed that TM was more effective than the standard care with a Hazard Ratio (HR) of 1.74, 95% CI 1.43-2.12; P<.001). In psychiatry and rehabilitation, a meta-analysis reviewing 43 studies of high methodological quality detected no significant difference between TM and face to face services (8). A recent study from Poland published 2021 have concluded that tele-monitoring of patients with CRT has improved their prognosis during the 2 years observation period and also decreased the rate of hospitalization significantly (9). A meta-analysis of 19 RCTs have showed that tele-monitoring in patients with Heart Failure has reduced hospitalization significantly with an Odds Ratio of 0.83 (95% CI 0.72–0.95, P = 0.007) (10).

The Communication Channels

Different means of TM have been used in the different studies. This included e-mails, Skype, mobile applications, interactive special programs or videoconferencing through specific systems. There was no study to assess how often an application or method of communication was used. In our study, phone calls (78.8%) was the most common method of communication closely followed by Whatsapp messages (77.3%) then Facebook posts and messages (16.3%). Neither e-mails nor Skype nor Specialized applications were among the most used methods. This could be due to the socioeconomic and educational status of the majority of the Egyptian population. There is limited access to professional TM services. Another reason could be the lack of professional organizing agencies and companies for the TM process in Egypt.

Barriers towards Effective Remote Medical Services

The technical aspect of TM is fundamental and represents a great challenge and opportunity in the same time. Many patients find it hard to participate in TM service because of technical difficulty. One study assessing the reasons of refusal to participate in a telemedicine clinical trial in Chronic Obstructive Pulmonary Diseases (COPD) patients found that 55 persons out of 560 persons representing 19% of the whole sample refused to participate because of logistical barriers (8). Our study tried to have a closer look on the details of these technical challenges. 66.7% of the participating doctors reported that lack of integrated medical assessment tools is a technical challenge. Additionally, 43.9% blamed the low educational level of their patients to the difficulty in communication through online platforms. Also, 19.7% of the doctors reported the unstable internet connection to be a challenge in maintaining proper TM service with their patients.

The COVID-19 Pandemic Effect

The COVID-19 pandemic has made many changes in the medical services. This has encouraged the transition towards TM (11). Both patients and physicians felt more ready and safe to experience TM during the pandemic. This is similar to what we have reached in our study as almost 75% felt safer providing TM services during the pandemic. Additionally, more than 95% of our study participants believed COVID pandemic has enhanced the transition toward TM and 92% believe it will keep going this way after the pandemic.

As regards development of the TM services on a national level, a recent study published 2020 have found that reduction of TM fees and raising of physicians' payment from 0.7 to 0.8 ratio would help improving the service (12). That are close to what we are recommending since 88.9% of the doctors participating in our study wasn't paid for their TM services. Physicians' training and development of guidelines and protocols for TM is crucial for development of the service as reported by 77% of our physicians (13). This is similar to what has been recommended in

orthopedics and published 2020 by Tanaka et al who have developed a protocol for orthopedic virtual examination (14).

Conclusion

Despite the fact this snapshot data has revealed that the Egyptian experience in TM service is far from the standard, it has showed that collaborative effort from all the stakeholders is mandatory (1). The COVID- 19 pandemic has enhanced the transition process, but some obstacles are still needed to overcome.

Recommendations

Further research on the TM in Egypt is required to provide clearer insights on the situation. New strategies to be developed by the Egyptian government and the leading medical institutions are needed. Appropriate training and payment to the health care providers for the medical services are needed. Finally, working on the internet infrastructure and public health awareness and usage of medical applications are key elements in developing the TM service. Further research is recommended to better assess the quality of TM in Egypt and evaluate its status.

Limitations

Some limitations have been faced along the study. None of them have been believed to impact the results and conclusion expression of the Egyptian reality in remote medical services. One limitation is that the study covered physician perspectives only as one aspect of the service. Additionally, the study is descriptive not comparative which doesn't reflect much on the causes and roots of the issue, but it provide description of the reality.

Conflict of Interest

There is no conflict of interest with any party.

References

1. Bokolo AJ. Exploring the adoption of telemedicine and virtual software for care of outpatients during and after COVID-19 pandemic. Ir J Med Sci. 2021;190(1):1-10. doi:10.1007/s11845-020-02299-z

2. Smith AC, Thomas E, Snoswell CL, et al. Telehealth for global emergencies : Implications for coronavirus disease 2019. 2020;2019. doi:10.1177/1357633X20916567

3. Kaminski J. Informatics in the time of COVID-19. Can J Nurs Inform https//cjni net/journal. 2020;(c):1-9. https://cjni.net/journal/?p=6820

4. Booth A. Qualitative Evidence Synthesis. Patient Involv Heal Technol Assess. Published online 2017:187-199. doi:10.1007/978-981-10-4068-9_15

5. Timpel P, Oswald S, Schwarz PEH, Harst L. Mapping the evidence on the effectiveness of telemedicine interventions in diabetes, dyslipidemia, and hypertension: An umbrella review of systematic reviews and meta-analyses. J Med Internet Res. 2020;22(3). doi:10.2196/16791

6. Buvik A, Bergmo TS, Bugge E, Smaabrekke A, Wilsgaard T, Olsen JA. Cost-effectiveness of telemedicine in remote orthopedic consultations: Randomized controlled trial. J Med Internet Res. 2019;21(2). doi:10.2196/11330

7. Chen L, Cheng L, Gao W, Chen D, Wang C, Ran X. Telemedicine in chronic wound management: Systematic review and meta-analysis. JMIR mHealth uHealth. 2020;8(6). doi:10.2196/15574

8. Speyer R, Denman D, Hons B, et al. Effects of telehealth by allied health professionals and nurses in rural and remote areas: A systematic review and meta-Analysis. J Rehabil Med. 2018;50(3):225-235. doi:10.2340/16501977-2297

9. Wita M, Orszulak M, Szydło K, et al. The usefulness of telemedicine devices in patients with severe heart failure with an implanted cardiac resynchronization therapy system during two years of observation. Kardiol Pol. 2022;80(1):41-48. doi:10.33963/KP.a2021.0175

10. Zhu Y, Gu X, Xu C. Effectiveness of telemedicine systems for adults with heart failure: a meta-analysis of randomized controlled trials. Heart Fail Rev. 2020;25(2):231-243. doi:10.1007/s10741-019-09801-5

11. Mishra V. Factors affecting the adoption of telemedicine during COVID-19. Indian J Public Health. 2020;64:S234-S236. doi:10.4103/ijph.IJPH_480_20

12. Yu J, Zhang T, Liu Z, Hatab AA, Lan J. Tripartite data analysis for optimizing telemedicine operations: Evidence from guizhou province in China. Int J Environ Res Public Health. 2020;17(1):1-23. doi:10.3390/ijerph17010375

13. Anthony Jnr B. Use of Telemedicine and Virtual Care for Remote Treatment in Response to COVID-19 Pandemic. J Med Syst. 2020;44(7):J. http://link.springer.com/10.1007/s10916-020-01596-5

14. Tanaka MJ, Oh LS, Martin SD, Berkson EM. Telemedicine in the Era of COVID-19. J Bone Jt Surg. 2020;102(12):e57. doi:10.2106/jbjs.20.00609