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Telemedicine Acceptance in Bahrain: Analysis of the Case of COVID-19 Pandemic

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Abstract

This study aims to describe the perspectives and lived experiences of physicians and users who used telemedicine during Covid-19 in Bahrain. The study is based on in-depth semi-structured interviews conducted with physicians and users in order to explore their perspectives on using telemedicine during the pandemic. Interview analysis revealed that healthcare professionals' proactiveness in offering and using telemedicine services during the pandemic contributed significantly to its acceptance and use by patients. Results show that telemedicine users have positive attitude regarding their telemedicine experience and they have high tendency toward using its services even after the pandemic is over, especially for chronic conditions and follow-ups. Results also show that despite the readiness of users for using the telemedicine, some telemedicine services still need improvements in the insurance services, controlled medicine regulation, applications and training for hospital staff and users/patients. The study provides valuable information for the successful implementation of telemedicine services in Bahrain.
Keywords: Covid-19; Healthcare; Technology; Telemedicine; Telemedicine acceptance.

1. Introduction

On March 11, 2020, the World Health Organization (WHO) declared the coronavirus disease 2019 (Covid-19) outbreak as a pandemic, and provided guidelines for health, safety and prevention in the health facility and community. One of the important guidelines is to reduce face to face consultations, and use telemedicine to provide care for patients without compromising the quality and access of essential health services. Telemedicine refers to "the delivery of healthcare services between geographically separated individuals, using telecommunication systems; e.g., video conferencing" (Coiera, 2003).

Telemedicine approaches are a convenient, safe and effective way to access health care without the risk of being exposed to the virus during the pandemic. After the global outbreak of (Covid-19) pandemic, shifting to telemedicine was among the most essential solutions for healthcare management and delivering timely care to patients in a wide range of countries around the world. In Bahrain, the National Health Regulatory Authority (NHRA) issued a circular in March 2020 to all healthcare facilities suggesting the use of face-to-face alternatives through providing telemedicine/teleconsultation in order to provide needed care for all patients at all levels while minimizing the risk of virus transmission by reducing the number of people with symptoms of Covid-19 to have contact with health facilities (Alsebaie, 2021). Similarly, the Ministry of Health also called allowing people to renew prescriptions online using its website in order to ensure patients' well-being and deliver timely care and medications to patients at home (Alsebaie, 2021).

For the first time, telemedicine platforms and services are extensively used by many patients and physicians in public and private hospitals in Bahrain due to the Covid-19 pandemic. The continuation of the pandemic along with the issuance of the official permission for using telemedicine have prompted many public and private hospitals in Bahrain to leverage the telemedicine options for delivering non-urgent care, like using telephone or video calls and platforms for real-time telemedicine and using WhatsApp to send patient data for "store and forward" telemedicine.

Given how the Covid-19 pandemic has highlighted the telemedicine importance and led to a shift to it in Bahrain, this study seeks to describe the perspectives and lived experiences of those physicians and users who were used the telemedicine during the pandemic regarding its acceptance and effectiveness/usefulness and related challenges. The study provides valuable information for health services providers and policy makers in Bahrain to understand the facilitators and inhibitors affect telemedicine implementation post pandemic.

2. Literature Review

This study describes the telemedicine experience in Bahrain during the COVID-19 pandemic, focusing on factors influencing telemedicine acceptance and use. Technology Acceptance Model (TAM) is used as a conceptual framework to analyze interviews in this study, thus, this section reviews factors affecting telemedicine based on TAM model, and telemedicine research conducted on Bahrain and the Arab world.

2.1. Factors Affecting Telemedicine Acceptance and Use

Literature review showed that the most commonly used theoretical frameworks in telemedicine adoption research over the last decade are different forms of extensions of the Technology Acceptance Model (TAM) and the unified theory of acceptance and use of technology the diffusion of innovation theory (Jacob et al., 2020). Telemedicine research based on TAM (Davis, 1989) emphasizes that using telemedicine is motivated by perceptions of its ease of use, usefulness, and external determinants. According to a systematic review of telemedicine acceptance and use studies published between 2008 and 2018 by Jacob et al. (2020), the numerous factors which may influence the physicians' and patients' decisions to use telemedicine can be categorized into two major themes: technological, and social and organizational factors. The technological factors are categorized into eight subthemes: (1) usefulness, (2) ease of use, (3) design, (4) compatibility, (5) technical issues, (6) content, (7) personalization, and (8) convenience. While the social and organizational, which found more influential in affecting telemedicine use, are categorized into eight subthemes: (1) workflow related, (2) patient related, (3) policy and regulations, (4) culture or attitude or social influence, (5) monetary factors, (6) evidence base, (7) awareness, and (8) user engagement.

Earlier studies provided an understanding of telemedicine resistance and how it can be successfully managed according to the aforementioned factors in western contexts. However, telemedicine literature has emphasized the importance of considering the contextual and cultural factors when examining telemedicine adoption and use in specific environments. This needs further exploration in different cultural, social and economic contexts (Jacob et al., 2020; Kamal et al., 2020; Rahimi et al., 2018). Thus, further research is needed to understand better and analyze telemedicine acceptance and use in the context of countries individually. The next section presents the telemedicine in the context of Bahrain and Arab world.

2.2. Telemedicine in Bahrain

There has been little research on telemedicine acceptance and use in Bahrain and the entire Arab world. In this study, multiple databases were searched for peer-reviewed and scholarly articles related to telemedicine in Bahrain and the GCC, and the entire Arab region to explore what has been covered in the literature. Based on returned search results, there is a shortage of literature about telemedicine in Bahrain. No clusters were identified in the published research (Weber, 2016), nor do we have much information on telemedicine implementations and experiences.

Database research returned few published articles related to telemedicine in Bahrain: one research on e-health system acceptance in Bahrain and two studies that provided evidence on the feasibility and efficacy of telemedicine in diabetes care. These studies are as follows:

The first study, carried out by Al Alawi and Ahmed (2012), aimed to develop an integrated diabetic retinopathy screening program within Bahrain's healthcare system that uses telemedicine. In this study, six telemedical screening units were established and equipped with a digital fundus camera at the primary health care clinic. Fundus photographs were transmitted via the Internet to a centralized reading center where a retinal specialist assesses the images. After analyzing data of patients screened between 2003 and 2009, Al Alawi and Ahmed (2012) concluded that a telemedicine-based screening program is a feasible and efficient means of detecting diabetic retinopathy and providing treatment in Bahrain. Therefore, Al Alawi and Ahmed (2012) suggested making family physicians use the program for follow-up cases, establishing guidelines, using full-time trained staff to operate the cameras, and giving clinical workshops for primary care physicians in Bahrain.

The second study is the first to examine Bahrain's e-health acceptance, as stated by Zolait (2019). The study aimed to investigate telemedicine acceptance by Bahraini individuals and the prominent factors that affect e-Health systems adoption in Bahrain. Zolait (2019), found in their analysis of data obtained through a survey from 150 participants in Bahrain that the most factors affecting e-health adoption are trust, health literacy, and attitude. Zolait (2019), verified that the extent to which individuals trust the e-health system and the ability to know how to use e-health services and technologies and attitudes positively affect e-health system acceptance. They concluded that e-health is still new in Bahrain, and most patients do not know that it has been implemented. However, people in the government and private sectors understand the benefits of the e-health system.

The third study, carried out by Alromaihi et al. (2020), aims to find an innovative method to sustain effective diabetes care during COVID-19. After four weeks of shifting from the face-to-face visits in the clinic to online telemedicine services and encountering 1,972 patients, they found that diabetes care can be transitioned to telemedicine effectively and would be successful in reaching more patients than an in-person visit. Results of their study showed that 68.5% (1351) cases were seen remotely, and 13.5% (268) cases were seen in person because they insisted on being seen in person or came as urgent or walk-in, in addition the average daily number of unreached patients was (4%) which is significantly less than the average of 20-30% before shifting to telemedicine. Alromaihi et al. (2020) concluded that telemedicine could be an essential healthcare service for diabetes patients in Bahrain and could be augmented by the use of technology like web-based applications and communication via the transfer of data from patients' glucometer, insulin pumps, or sensors. Also, they have called for further evaluation research to assess patient satisfaction and the impact of telemedicine on patients' glycemic control.

2.3. Telemedicine in the Arab World

There has been little data and research that measures the progress and level attained concerning telemedicine use in Bahrain and other Arab countries (Waqas, 2021). In general, telemedicine needs further monitoring and exploration in the Arab World, as there are still many gaps in the research on telemedicine in the GCC and Arab countries.

Scientometric analysis (Waqas, 2021), which analyzed the scholarly contributions in the field of digital health in the Arab world, found telemedicine research is still in its infancy in the Arab countries, which lack innovation in telemedicine and mHealth. Waqas (2021) identified a wide range of gaps in digital health research and data, one of which is the lack of qualitative studies, which are required to explore the factors influencing the uptake and scaling-up of digital health programs in the region based on the perspectives of the end consumer. In the GCC, a systematic review by Weber (2016) showed both patient and practitioner user satisfaction with using telemedicine services is an important area of interest in the GCC countries, with 21 studies devoted in this topic, up to December 2014. However, Weber (2016) identified gaps in GCC e-health research, including few published studies on cost-benefit analyses and research targeting gender and religious issues and few controlled interventional studies.

As seen, the literature review in this study revealed that many gaps exist in the data required for assessing the effectiveness of telemedicine services and the satisfaction of its practitioners and users in Bahrain and Arab countries as a whole, for instance, data about the usability, accessibility, costs, and affordability, and there is missing evidence on health outcomes, actual clinical, and economic impact of telemedicine.

For telemedicine uptake and scaling-up in Bahrain post pandemic, further data and research are needed on factors related to effective telemedicine adoption and use by physicians and end-users. Therefore, to address this gap, the present study aims to understand in-depth the factors that influence telemedicine acceptance and use by identifying the motivating factors and various challenges of telemedicine in Bahrain, based on Covid-19-related experience.

3. Research Method

Previous studies show the importance of addressing the characteristics of the telemedicine context when looking at the factors that might influence its use. In this study, a case study approach was adopted, which is considered an appropriate approach when exploring a contemporary phenomenon in depth and within a specific real-world context (Yin, 2017). Qualitative semi-structured interviews were conducted with representative physicians and patients or users to explore and describe their experience in using telemedicine during the time of Covid-19, and understand their thoughts on telemedicine acceptance, effectiveness, benefits and challenges in Bahrain. As TAM has been proven to be a robust theory in telemedicine research and tested in different contexts (Zheng *et al.*, 2007), this study used TAM (Davis, 1989; Davis *et al.*, 1989) as a conceptual framework to analyze the interviews and understand telemedicine acceptance determinants, based on participants' perspectives and experiences in using telemedicine during Covid-19 in Bahrain.

A purposive sampling technique selected five representative physicians to participate in this study. Table 1 presents participants' demographic data concerning job title, gender, years of experience, and hospital type. They were selected for their practical experience and knowledge obtained from telemedicine practice during the pandemic in Bahrain. Also, their background experience in chronic diseases and mental health and their notable efforts in raising community awareness of the importance of physical and psychological health during the pandemic.

Table-1. Demographic data of physicians

Participants	Job title	Gender	Years of experience	Hospital type
D1	Consultant endocrinologist	Female	16	Public
D2	Clinical psychologist	Female	5	Private
D3	Consultant psychiatrist	Female	14	Private
D4	Family physician and diabetologist	Female	20	Private
D5	Pediatrician	Male	More than 30	Private

The variety of participants' backgrounds was essential in learning more about their views on using telemedicine and how to improve its services during and post Covid-19. Therefore, the interviewed physicians in this study were also asked to help find patients or users willing to participate in the interviews. These patients were asked to recommend other telemedicine users to participate. Six participants were interviewed over the phone using this word-of-mouth method: one patient of a doctor (D1), one family member of a patient reviewing doctor (D4), and the other participants were recommended by the previous patients, as shown in Table 2. In total, ten participants with different backgrounds were interviewed.

Table-2. Demographic data of patients and telemedicine users

Participants	Gender	Age	Telemedicine users	Age and gender of the patient(s)	Reason for using telemedicine	Specialist
P1	Male	40	Son of patient	72-year-old father	Diabetes type 1/ Follow-up visits	
P2	Male	33	Patient		Diabetes type 1/ Follow-up visits	
P3	Female	40	Mother of patient	11-year-old daughter.	Scoliosis/ Orthopedic	Orthopedic
P4	Female	45	Patient		Medical issue Acne	Internist Dermatologist
P5	Female	25	Mother of patient	2-year-old girl	Acute conjunctivitis	Pediatrician
P6	Female	32	Patient	-	Cancer/ Follow-up visits	Oncology

These interviews were conducted online using Zoom's videoconferencing application during the Covid-19 pandemic, and thus, social distancing was necessary and critical at that time. Before each interview, the researcher sent a consent form to the participant that provided a brief explanation of the study, which was ethically approved by the Bahrain Center for Strategic, International & Energy Studies (Derasat) and UNDP Bahrain. Interviews with the physicians were recorded using the Zoom application and took an average of 35 minutes; the shortest interview was 20 minutes, and the longest one was 48 minutes. Phone interviews with patients and telemedicine users were recorded with a mobile application and took 7 an average of minutes. All interviews were transcribed and then coded manually to identify themes and determinants of telemedicine, guided by TAM model.

Concerning the validity and credibility of the study, the interview questions were sent to two professionals from UNDB Bahrain and two researchers from Bahrain Center for Strategic, International & Energy Studies (Derasat) for testing, checking, validating, and pretesting. In addition, the interview questions were revised based on the professionals' and researchers' feedback and comments. Furthermore, a member check approach was implemented after conducting the interviews. Finally, a final copy of themes and interpretations was sent via email to all participating physicians to find whether the findings confirmed their views.

4. Research Results and Discussion

Perceived usefulness. Patient load balancing and improved healthcare efficiency are the most critical advantages of telemedicine from physicians' point of view. Participating physicians were asked about their experience with telemedicine, and their responses about the benefits and drawbacks are summarized in Table 3.

Table-3. Variables related to perceived usefulness found in interviews (physicians' and users' perspectives)

	Benefits	Drawbacks
Physicians/ Profession	• It improved healthcare efficiency and cost reduction for the health administration and authorities. • Maximized daily number of patients receiving urgent healthcare in the hospital. • More convenient and efficient appointment scheduling for patients. • Reduced time spent on following-up care. • Reduced or eliminated travel time to healthcare facilities. • More confidentiality and privacy in the service of mental healthcare.	• Prescription of controlled medicines is restricted by telemedicine guidelines issued by health authorities. • Dispensing of controlled medications is not permitted in pharmacies outside the country. • Telemedicine approaches are not covered by health insurance. • Some clinical activities involving face to face interaction in mental healthcare.
User/ patients	• Saves time and effort. • Convenient and easier for regular medical conditions and follow-ups. • More safe during the pandemic.	

Shifting to telemedicine during Covid-19 has increased the average number of daily patients treated in the hospital. In the interviews, there is a standard view among participating physicians that patients became more willing to show up and less likely to miss appointments due to telemedicine services. For example, physician (D1) stated "*the daily average number of patients receiving healthcare in hospital increased by about 16% compared to before applying telemedicine and the pandemic*". The same physician also noticed that "*appointment cancellation rates in the hospital declined from 20% to 4% compared to before*". This declination is attributed to the convenience and efficiency of scheduling appointments and virtual visits for the patients. Furthermore, "*telemedicine provides more*

convenient options for accessing mental healthcare services while maintaining patient's confidentiality and privacy", as physician D3 stated.

In addition, the interviewed physicians believe that telemedicine adoption combined with remote monitoring applications used to manage chronic conditions, like chronic heart failure (CHF), diabetes, and hypertension, and access online patients' home readings, can play a supporting role in helping patients and efficiently managing health facilities in Bahrain. Three physicians' responses (D1, D3, D4) to the interview's questions indicated that diabetic patients (70 percent) and people with some mental health conditions could employ telemedicine and use tele monitoring devices to enable physicians to follow up with them, this allowing smoothing the patient load, making services more available to patients, and saving cost and time amount spent on follow-ups. In addition, physicians (D1 and D4) believe that" home *monitoring applications and devices offer potential benefits for chronic patients, like allowing more frequent and convenient monitoring, giving more control over their health*". Consequently, they believe this can help improve healthcare efficiency by reducing its annual direct cost, and allowing more time for healthcare management, planning, and research in hospitals.

Similarly, all patients/users in this study reported that using telemedicine is safer during the spreading of the virus Covid-19. They viewed it saves time and effort, and it is more convenient and easier for only stable medical conditions and follow-ups. Participant (P1) stated, "*Due to the pandemic, I have requested from the clinic to have a telemedicine appointment to reduce the risk of infection.*" Participant (P4) stated, "*My two daughters were scared to go outside home, and when they heard that some dermatologists started to offer telemedicine option, they decided to call them because it was a convenient and safe option…they were taking pictures of their skin problems and send them to get treatments*".

However, physicians in this study also have mentioned some drawbacks and difficulties faced in using telemedicine, in of which health insurance coverage and mental health care delivery and regulations.

During the pandemic, some health insurance services were unprepared for using telemedicine, which "prompted some hospitals and insurance companies to communicate and find immediate solutions for this," physician (D4) stated. In addition, concerning mental health care, physician (D2) said, "some clinical activities require face-to-face interaction in mental healthcare", while physician (D3) stated that "psychiatrists and pharmacists are unauthorized to prescribe controlled medicine according to mental health care regulations and telemedicine guidelines issued by health authorities during the pandemic."

Perceived ease of use. Using telemedicine methods during the pandemic has revealed some specific problems mentioned by physicians in this study, like scheduling calls, bandwidth and connection quality, and technology skills. For example, physician (D1) stated that "*physicians faced difficulty controlling virtual visits schedule and calling patients on time.*" When a doctor cannot make the scheduled call on time, the patient has to wait one hour and sometimes more for the doctor's call. Thus, as the doctor (D1) stated: "some *healthcare professionals, like physicians and nurses, still need sufficient training in teleconsultations and how to use remote monitoring applications.*" Physician (D2) stated that "*patients sometimes suffer from poor internet connectivity or video conferencing quality*" or need assistance or support in accessing telemedicine services. Physician (D1) stated that "*we saw some patients don't know how to open the camera during the call.*" Physician (D4) stated that "*the elderly people need assistance from others in the telemedicine services.*" Also, some members of the medical staff need training in how to use the telemedicine application and certain home monitoring applications".

Attitude toward usage and intention to use. First official use of telemedicine of physicians in this study began during the Covid-19 pandemic. Concerning the question about physicians' attitude toward telemedicine and intention to use it after the pandemic. They showed a strong desire and tendency to adopt telemedicine services in the future if these services continue to be officially offered in Bahrain (D1, D3, and D4). However, one physician (D5) stated that "*the telemedicine service will only be given if the patient requests this option.*"

Overall, patients and users have shown supportive and positive attitudes toward telemedicine adoption during the pandemic. Moreover, they expressed their satisfaction with telemedicine in services they already used. They ranked their satisfaction with telemedicine as excellent or very good. All participants are likely to use telemedicine as they see it as more convenient, easier, and time- and effort-saving than in-person visits for chronic disease management, follow-up, less acute conditions, and medication prescription ordering.

Ironically, while patients and end-users rated their telemedicine experiences highly and desired hybrid in-person and telemedicine models for healthcare by hospitals in the future, they still prefer in-person care. They see that in-person visits are still preferable and can offer more benefits to the patient when compared to virtual visits because of the following:

- Ability to immediately do the necessary clinical or radiology examinations and laboratory tests, especially at the first diagnosis or when chronic patients' home readings are abnormal. Participant (P6) stated that "*Easier diagnosis. Doctor can do the necessary examinations (take blood, pressure, etc.) in in-person visit*". Participant (P1) said, "*in-person visit especially when patient's home readings are observed to be abnormal.*"

- Allows the patient a stronger conviction about the doctor's consultation and advice and provides elderly patients psychological satisfaction and a sense of social inclusion and family care. Participant (P5) stated that "*I prefer in-person visits because of a psychological factor (sense of conviction about what the doctor said).*" Participant (P1) stated that "*Psychological needs of the elderly (sense of caring by family and doctor, sense of contentment and well-being).*"

- Avoiding discomfort with technology and applications, like video calls or telemedicine platforms, is required in communication and making virtual visits between the patient and doctor or service provider. For example, the participant (P1) stated, "*I like personal interaction and feel with video chat and technology.*"

- Convenient face-to-face interactions between physicians and patients and the ability to have more control over the discussion, ask the doctor more questions, and discuss more problems during in-person visits. Participant (P1) stated that "in the virtual patient feels that has to shorten the conversation and briefly explains the faced problems". Participants (P3, P2) said that "*I prefer in-person visits when I have a long list of questions or a long explanation.*"

  External factors and facilitating conditions. Physicians were asked about how existing telemedicine services in Bahrain could be improved? The physicians identified actions to be taken to strengthen telemedicine acceptance and continuing use after the pandemic, including:

- Health insurance: physician (D4) stated that "*companies have to provide coverage for telemedicine services to all in-network providers.*"

- M-Health adoption: some physicians (D1, D4, and D3) called for more integration of mobile healthcare applications (M-Health) and home healthcare monitoring applications into telemedicine systems, which can be used for remote patient monitoring and accessing patients' home readings (e.g., glucose, blood pressure, weight, moods, etc.).

- Telemedicine platform: Doctor (D4) stated that "*telemedicine providers have to use reliable and secure telemedicine systems/solutions including patients' data, videoconferencing, chat, scheduling, claims and billing management, and electronic prescription applications.*"

- Network and records: physician (D3) suggested "*creating a national telemedicine network and records for medical and mental health care should be seen in the future as a new way to control and monitor medication prescription electronically at local level.*"

- Regulations: some physicians (D1, D4, and D3) called for establishing more rules for telemedicine service implementation, security and privacy.

5. Conclusion

This study concludes that after the actual telemedicine practice during Covid-19 time in Bahrain, there is a clear attraction and tendency toward making telemedicine an official option for delivering health care to patients. Interviewed physicians, patients, and other users have a positive attitude toward telemedicine, especially for chronic, not acute, conditions and follow-ups. Also, physicians view that telemedicine reduces healthcare costs, speeds up, and maximizes daily healthcare services provided to patients. More importantly, the interviews anlysis revealed that healthcare professionals' and providers' interest and proactiveness in offering and using telemedicine services contributed significantly to its acceptance and use by their patients. Thus, this is seen as a positive factor that confirm users' readiness for telemedicine in Bahrain.

However, interviews revealed that some telemedicine services still need improvements. For example, some health insurance systems are still far behind in using telemedicine methods in healthcare services, which can be a barrier to telemedicine adoption. Also, due to the regulations, psychiatrists/physicians are not allowed to prescribe controlled medicine in telemedicine services. Furthermore, all hospital staff involved need to practice and get the necessary training on how to efficiently and effectively use telemedicine and mHealth applications to improve their performance and telemedicine outcomes.

Therefore, comprehensive communication and cooperation between all stakeholders including healthcare providers, regulators, health insurance and pharmacies, is vital factor for the acceptance and widespread adoption of telemedicine in Bahrain. The findings from this study suggest future studies to extend the research to more physicians from various medical specializations to determine if there is a need for other improvements required for proper telemedicine deployment.

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