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Exploring the Adoption Challenges of Shlonik Application during the COVID-19 Pandemic in Kuwait

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Abstract

During the COVID-19 pandemic, the telemedicine systems have emerged as one of the most useful and the safest systems to deliver high-quality care. Telemedicine systems offer some key advantages to combat the disease such as reducing the risks of exposing patients and clinicians to the virus by safely treating patients remotely. However, people face educational, technical, financial and ethical challenges while using such telemedicine systems. In this article, we investigate some essential challenges hindering the adoption of the telemedicine software application, such as the Shlonik app in Kuwait. Interviews and online surveys are conducted with doctors and patients to gauge their opinion about the Shlonik app. Then, data is analyzed based on the participants' replies to highlight the key challenges and features missing in the application for further enhancement. Based on the study, age, education, and complexity of the application are the key factors hindering its usage. Three key missing features in the Sholink app include online chatting, tracking patient condition, and emergency call button. The acceptability of the Shlonik app can be enhanced in future by incorporating the missing features in its design and implementation.

Keywords: Telemedicine systems challenges; COVID-19 pandemic; telehealth systems concern; Kuwait.

1. Introduction

During the past year and till today, the world witnessed the catastrophic development and fast spread of the novel coronavirus disease 2019 (COVID-19) and its mutated strains. According to the World Health Organization, the COVID-19 pandemic is still spreading causing more than 3 million deaths worldwide [1]. The widespread dissemination of this virus has led to phenomenal challenges in many different areas and systems of life. One of the most impacted domains during this pandemic is healthcare and its services. According to recent news by the World Health Organization [2], COVID-19 continues to disrupt essential health services in 90 % of countries. Rehabilitation and recovery services have been

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in nearly 63% of nations, in spite of the fact that rehabilitation is the main key to solid recuperation after serious sickness from COVID-19. Actually, there are many different challenges that the healthcare domain has encountered during this pandemic, and one of the solutions to overcome these challenges is telemedicine systems [3]. Telemedicine or telehealth is the provision and management of healthcare in which individuals who often work with family members to manage aspects of their care with remote support from healthcare professionals. Telemedicine includes email, two-way video, smartphones, laptops, and wireless tools which can be used in many services by using different applications [3], so it can be very helpful for patients and the doctors.

Many patients around the world need medical care assistance during this pandemic, however, due to the lockdown, many patients are left wondering about the way they get their necessary treatment or medical consultancy. There are several patients with different chronic diseases who cannot wait long without medical assistance. The COVID-19 pandemic has elevated the need for telemedicine and E-Health systems in combating disease all around the world. Telemedicine systems can help medical personnel to control, plan, and enhance the medical treatment process for any patient. Moreover, it aims to help physicians, hospitals and clinics to deliver the right treatment for patients during the period of the lockdown. Telemedicine systems can also provide a safer environment for both the caregiver and the caretaker during the spread of the coronavirus by enabling physical distancing, tracking symptoms and outbreaks, and supporting policymakers in anticipating needs and deciding appropriate and timely interventions [3]. Therefore, several organizations, hospitals and clinics have adopted telemedicine services and many countries' governments have opted to invest more in the development of telemedicine systems to extend traditional health care services [4].

During the COVID-19 pandemic in Kuwait, a telemedicine software application called "Shlonik" [5] was used which has many key characteristics to help in preventing the spread of the disease. This application was launched on April 18th of 2020 in order to control the spread of the COVID-19 by monitoring infected people daily status and offering them 24 hours' connectivity with medical personnel to better assist their medical condition. "Tabeeby" [6] is another application in Kuwait that allows users to reserve and organize appointments in clinics and hospitals easily. Users can book a virtual appointment with a specialist doctor through a video call, for example, to facilitate the consultation, especially for elderly and home-bound patients. It also provides the user with the feature of saving personal reports and prescriptions in a personal file, while ensuring the confidentiality of each user's data.

However, providing the right care through these telemedicine software apps and facilitating the adoption of these apps is becoming a major challenge for several organizations and hospitals during the

pandemic. There are many different challenges that affect the approval of software telemedicine systems such as financial, technical, and educational challenges. Implementing these types of systems might be complicated and require a large investment of money and experience in order to be successful [7]. Studying telemedicine software apps adoption can help stakeholders better recognize patients and medical personnel needs, and eventually allow successful telemedicine apps that positively combat the COVID-19 pandemic. Even though the telemedicine systems idea was introduced several years ago, there has not been much analysis of the challenges that influence the telemedicine apps usage during this pandemic, especially in Kuwait. Thus, in this research, we are trying to explore and investigate the major challenges that impact the telemedicine Shlonik app usage in Kuwait during the coronavirus pandemic. We first searched and reviewed different existing studies related to the adoption of telemedicine systems to report their key challenges. Then, this qualitative study explores the challenges that face the telemedicine Shlonik app adoption in Kuwait through online survey and interviewing people from several backgrounds such as doctors, pharmacists and patients infected with coronavirus. The aim of this study is to provide some type of guidelines to better assist healthcare domain professionals and the Ministry of Health in Kuwait in developing more user friendly and successful telemedicine software apps.

2. Subjects and Methods

2.1. Related works

Several research studies have reported the importance of telemedicine systems and challenges that impact the adoption process of these systems. Brokolo [7] explored the adoption of telemedicine and virtual software care of outpatients during and after the COVID-19 pandemic. The author pointed out some factors hindering the adoption of the telemedicine systems, such as the availability of robust IT infrastructure, licensing and regulatory services, equipment costs, training of both physicians and nurses, and alterations to integrate within current hospitals workflow [7]. Garg et al. [8] suggested that designers must consider some key features such as age, gender, education, digital literacy in the design of telemedicine programs for their successful usage and adoption. In addition, chronic pain patients such as some elderly are susceptible to COVID-19 [9]. Visiting hospitals is very distressful to them so telemedicine care would be more suitable for them. Furthermore, patients with diabetes are at great risk during this pandemic because they are more likely to have worse symptoms than normal people [10]. Telemedicine systems allow such patients to have access to healthcare services without the need to leave the home causing an increased risk of exposure and infection to COVID-19. Okereafor et al. [11] mentioned some of the important uses and challenges of telemedicine's systems to combat COVID-19 in several countries such as the United States and China. The authors mentioned the lack of policy and

legislation on telemedicine, regional economic backwardness, and health insurance limitations as major challenges that encountered the usage of telemedicine systems.

The authors in [12] reported that 90% of the people surveyed were in favor of using telehealth technology. However, there were some patients that didn't benefit from telemedicine applications either because of lack of internet, or they prefer to have a personal visit to the doctor for consultation. Ethical challenges are the biggest challenges in telemedicine systems as reported by Biswas and Batra [13]. People who are using telemedicine technology need to be sure that their private information is safe from phishing attacks. In [14] research letter, a questionnaire was done in India for drug-resistant tuberculosis patients. Their result shows that after two months of using the telemedicine technology 68% of the patients like the idea of a telemedicine system which solves many problems for them. However, 27% of the patients did not find the idea of telemedicine system efficiently good. A patient who refused telemedicine technology has reasons such as the quality of care and misdiagnosis.

2.2. Research Methodology

The outline of our research methodology is given in Figure 1, which consisted of three phases. In the literature review phase, the authors searched for different papers with topics related to telemedicine and telehealth implementation in Kuwait and around worldwide. The keywords used were: telemedicine, telehealth, COVID-19, challenges, and Kuwait. Then, several related research papers in the literature were identified and studied to better understand how we can apply them as support to our study. This source of keywords gave an overview of the challenges and factors that affect the adoption of telemedicine systems.

To increase the validity of this work, we applied two well-known data collection methods of an online survey and an open-ended interview. An online survey was conducted containing several questions related to the telemedicine topic in Kuwait, particularly during the COVID-19 pandemic. The survey was specifically made for medical personnel because of the nature and pressure of their work during this pandemic. An online survey was considered the best option for doctors due to their erratic work schedules, and hence allowing a questionnaire accessible anywhere and anytime would overcome this issue. On the other hand, people who have been infected previously with COVID-19 were asked to participate in an open-ended interview. The interview was either through phone calls or real-time meetings with previously infected people. The interview allowed us to communicate easily with the interviewees and ask them for more details, which was not an affordable feature via online survey. The questions the participants answered during the live interview were similar to the questions on the online survey to allow comparisons between the two types of data collection. Furthermore, the idea behind having two different types of participants, medical personnel and the previously infected people, is to gather more information from

two different perspectives and compare them to each other to achieve the best result. The essential focus of these two types of data gathering methods is to better understand and address the major challenges that face the usage and the adoption of telemedicine software apps in Kuwait. Additionally, the data can better assist future studies and stakeholders to recognize these challenges and better tackle them when it comes to the idea of developing new telemedicine software systems.

Hence, we can base the work on the following three questions:

Q1. What are the major challenges and factors that affect the adoption of telemedicine Shlonik app in Kuwait?

Q2. Can this study's results help in developing good telemedicine software systems in Kuwait?

Q3. How to improve the adoption of telemedicine Shlonik app in Kuwait?

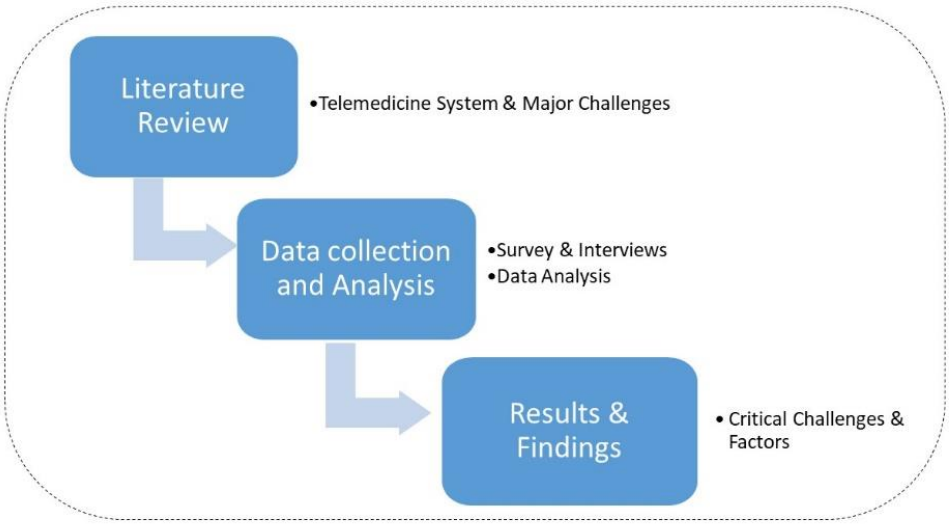

Figure 1: Research methodology framework

2.2.1 Data collection

In this research, qualitative research is conducted, based on two methods: an online survey and open-ended interview. As stated before, the survey was online based and only for medical personnel such as doctors, nurses, and pharmacists, while the interview was an open-ended interview and was only for previously infected persons. This type of research helps us as researchers to understand the telemedicine software apps challenges for adoption from multiple sources and perspectives. The qualitative research approach is the perfect way to investigate more thoroughly the participants' demeanors, attitudes, and conviction because it does not respect facts as objectives, but as a subjective reality related to contrasts in each person [15]. In addition, it may be an accommodating strategy to inquire about study objectives in a smooth and considerate manner. The qualitative approach in this work helps in exploring more

information from the participants as well.

2.2.2 Data extraction and synthesis

During the data extraction and the stage of review, we are aiming to synthesize and categorize the related papers based on their scope as related to telemedicine systems challenges during the COVID-19 pandemic. Thus, the related selected papers were reviewed in detail and major data and challenges were extracted and synthesized to achieve the appropriate answers to the research questions. A summary of key challenges related to the adoption of telemedicine software systems found in existing works is given in Table 1.

Table 1: Main challenges facing the adoption of telemedicine systems extracted from previous works

Challenges	Description	Literature
Technological	Patients and medical personnel facing technological difficulty in using telemedicine systems.	[8], [17]
Financial	Availability of funding and high cost of telemedicine systems.	[3], [7], [8], [11], [13] [16]
Lack of technical support	Lack support of medical personnel to perform various activity such as installation, operation, maintenance and security. Lack internet connection, low speed and high traffic during telemedicine systems usage.	[7], [8], [9], [12], [16]
Educational	Patients and medical personnel lacking of awareness of internet skills and how to use the telemedicine systems, different language speaking.	[7], [8], [9], [17]
Ethical	Openness of telemedicine systems challenging security and privacy of personal information of patients and medical personnel.	[3], [7], [8], [13], [16]
Lack of technological infrastructure	Low-level infrastructure such as hardware, software, network capabilities within hospitals, clinics, etc.	[7], [9], [11]
Lack of acceptability	Patients and medical personnel lack of acceptance due to several reasons such as lacking technology acceptance. Also, they are resistance to technology change.	[9], [11]
Long term evaluation	More time needed to evaluate new systems and predict future results to avoid failures.	[9]
Complexity of design	Complex designs, not user-friendly.	[8]
Lack of guidelines and legislations	Few guidelines such as overarching principles and practical framework and policies by the government that support telemedicine systems.	[7], [9], [11], [16]
Reliability	The probability that telemedicine systems perform its intended functionality without failure.	[9], [16]

3. Results

This section includes findings that lead to the identification of the major and essential challenges that encounter the telemedicine Shlonik app usage and adoption during the COVID-19 pandemic. Depending on the feedback we received from the respondents, we were able to list the main challenges

that telemedicine systems such as “Shlonik” application face. Also, we are able to see how we can improve these telemedicine apps to better serve the stakeholders.

First, we did interviews with 31 doctors who worked during this pandemic. Most of the questions are about the usage of the telemedicine Shlonik app, how to improve it and is it possible to implement these systems in Kuwait without mistakes? We did the interview via SurveyMonkey software, and our result is the following: 100% of doctors make sure that this pandemic shows the important need of adopting telemedicine software systems. Around 90% of them agreed that the telemedicine Shlonik app helps in preventing the spread of COVID-19, although 80% of doctors are afraid of the risks that could happen if they have not implemented the telemedicine application in an integrated way. Moreover, 75% of physicians agreed that we can apply the telemedicine software system in Kuwait. In the survey, we also added a table that includes some aspects to gauge doctors’ opinions on whether these aspects will affect the implementation of the telemedicine application or not. Table 2 shows these important aspects that can could be considered as challenges that could impact the adoption and the acceptance of telemedicine software systems. We used 3-point Likert scale: “disagree”, “neutral”, and “agree”.

Table 2: Impact of different factors in the adoption of telemedicine Shlonik app

	Agree	Neutral	Disagree
Gender	22.60%	51.60%	26%
Age	3%	12.90%	83.90%
Culture	3.30%	23.30%	73.30%
Education	3.20%	12.90%	84%
Number of population	10.30%	31.00%	59%
Civilization	7%	32.30%	61.30%
Complexity of the Apps	0%	16%	84%
Cost	12.90%	22.60%	65%

On the other hand, we did an interview with 12 people who were infected with COVID-19. The outcomes from the interview are as follows: 15% of them confirmed that the telemedicine Shlonik app that was used in Kuwait during the pandemic was helpful, although they were asked to visit the nearest hospital after they receive the confirmation message that their result is positive after doing the test. The other 85% of patients did not find the Shlonik application so useful during quarantine. Another important challenge is the complexity of the application, particularly for the elderly and the technically-challenged individuals. Other questions were also asked in the interview which were: how can designers improve the application? What was missing? We analyzed the suggestions and we came up with the missing features as shown in Figure 2. All these requirements were suggested to be implemented in the Shlonik app, and for new applications that the Ministry of Health would create in the future. Some patients mentioned that

it would be better to implement a new application and design it from the very beginning instead of trying to fix the current telemedicine app in Kuwait for COVID-19.

4. Discussion

There are many things that the patients mentioned that needed to be improved in the Shlonik app. Almost all the patients have complained about the selfie pictures. A selfie needs to be taken by the patient almost every 2-4 hours throughout the day. This feature was very annoying for patients mostly for females. Many women were afraid of the safety and security of their pictures, as well as the constant need to be head covered in order to take pictures during the day within their own homes. Furthermore, there wasn't any connection between patient and doctors which is something very important. Most of the patients faced this challenge because they needed to communicate with doctors, but instead had to through social media or calling some hospitals or pharmacies. This would have been much easier if there was a form of online communication between the doctor and patients through the application. Also, some of them mentioned that they were so nervous because there is no patient status tracking. Not having any reassurance for improvement on their infection by being in quarantine made patients worry they were doing something wrong or incorrect, further worsening their anxiety and increasing their desire to talk with a physician about their issues.

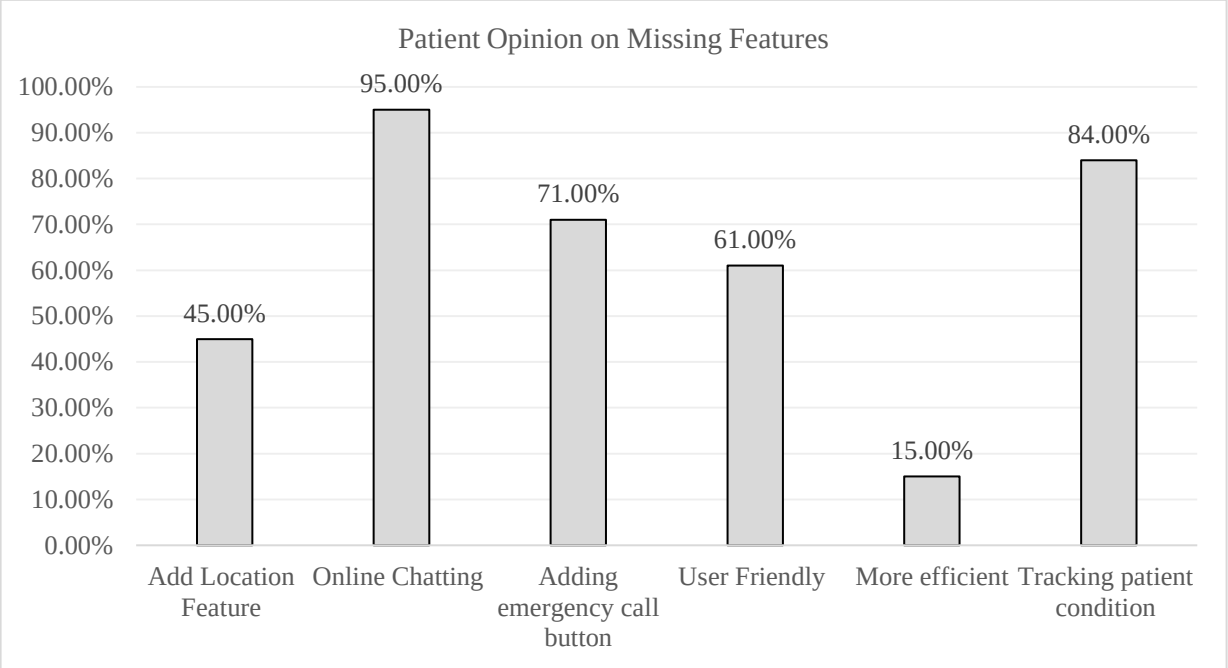

Figure 2: Features missing in the "Shlonik" application

Moreover, there are many other challenges that the respondents mentioned. Misdiagnosis is one of these challenges that respondents are afraid of while using telemedicine apps. Therefore, the

applications need to be technically efficient to avoid this mistake. Second, the educational challenge which helps in making the adoption of telemedicine apps so helpful. Most elderly people around the Arabian Gulf are not well-educated, and thus, using telemedicine apps could be difficult for them. Elderly folks are also more prone to COVID-19 and other diseases, indicating that telehealth has a maximum impact in this population. The telemedicine application must not be complex, so people of different ages can use it easily. Ethical challenges could keep any user feel anxious about using the telemedicine software system. Patients need to be sure that their personal information is safe from hacking and hackers of secret regulations. Finally, the financial challenge. As we know, implementing a very efficient system will cost the country a lot, so we need to have a cost limitation to not exceed it. Finally, installing and using the application should be free in order to make sure that all people will benefit from it. All the mentioned challenges are important to have a successful and civilized telemedicine app.

5. Conclusion

To conclude, the world is now facing a very serious disease and we cannot predict when this pandemic will be over. Collaboration and co-operation between various specialties is needed to ensure minimal loss of life as we continue to combat the infection spread. The telemedicine software apps can be very helpful during this pandemic. However, there are many challenges that we should consider when we think of adopting these software apps to better deliver the right services. This paper focused on the main challenges that telemedicine Shlonik apps in Kuwait face and compare them to the major challenges around the world. Thus, by relying on these challenges' analysis we can overcome them and improve the telemedicine Shlonik apps to provide the best-required functionalities more accurately. Implementing telemedicine software systems and improving them will help in preventing the spread of the coronavirus pandemic and any other pandemic we encounter in the future. Future work needs to be focused patient groups such as elderly, kids, or home-bound patients to learn the challenges they uniquely face. Educational and financial cost analysis studies should also be conducted to assess the large scale feasibility of telemedicine applications in the general public. Furthermore, developing telehealth options for conditions other than COVID-19 need to be created and tested to improve patient satisfaction.

6. Declarations

6.1 Conflict of Interest Statement

The authors declare no conflict of interest.

6.2 Funding Disclosure

The authors disclose no financial funding for this article.

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