Telehealth as a public health approach to mitigate the COVID-19 pandemic in Pakistan: A narrative review

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Abstract

Technology is instrumental in delivering health services, especially telehealth during the COVID-19 pandemic. This article aimed to explore the role of telehealth as a public health approach to support responses to address the COVID-19 pandemic in Pakistan. We developed this article by mapping existing telehealth initiatives developed and implemented during the COVID-19 pandemic in Pakistan. The initiatives were identified searching online portals such as Google Scholar, PubMed, and websites of various governmental and non-governmental agencies. The services are categorized into teleconsultation and follow-ups, online vaccine registration, information dissemination, high-risk subset tracking, virtual Health Care Worker (HCW) and medical student training, and tele-psychological counseling. The teleconsultation category offers online registration and follow-ups. Information dissemination services include federal helpline, SMS alerts, and social media campaigns. The high-risk subset tracking services include app-based COVID-19 checks and online surveys. Virtual HCW and medical student training services include tele-ICU support, COVID-19 critical care courses, and COVID management courses. The tele-psychological counseling services offer helplines for emotional support, proactive counseling for COVID-19 patients, and mental health support and psychiatry services. Telehealth interventions provided novel solutions amid health and social crises such as the COVID-19 pandemic. Health care systems need to expand telehealth services and ensure that health care organizations deliver effective and safe medical care. However, future research should focus on assessing the impact of telehealth on population health.

Keywords

Telehealth, pandemic, COVID-19, mobile health, telemedicine, health system

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Background

"Telehealth (or Telemedicine) refers to the use of Information Communication Technology (ICT) in the provision of health services at a distance in which teleconsultations is a live or store-and-forward mode."[1] Telehealth encompasses both provider-to-patient and provider-to-provider communications and can take place synchronously (telephone and video), asynchronously (patient portal messages, e-consults), and through virtual agents (chatbot) and wearable devices.[2] Telemedicine promises better use of technology with the help of handheld devices, for the expansion and advancement of services, such as remote area coverage, monitoring of health care professionals (HCPs), remote diagnosis, patient monitoring, surveillance, information dissemination, and health education and communication messages.[3] Furthermore, many smartphone applications also provide facilitations to HCPs in their daily tasks, such as time

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management and use of information, access to and storage of patient information, health promotion and education, training and references, timely communication, monitoring and tracking of patient, organization of data, and decision-making.[4] During the COVID-19 pandemic, the major public health concerns were nonfunctional health facilities and lockdown to reduce spread of infection. Despite these limitations, there was a window of opportunity for digital entrepreneurs who are attempting to support the health system through new telehealth services.[5] Telehealth was found promising in providing opportunities which included contact tracing[6] screening, patient consultations,[7] and psychological and mental health counseling.[8] The increasing trends of mobile phones have opened the potential for telecommunication to help health care system for COVID-19 response. Furthermore, Pakistan Telecommunication Authority (PTA) reported about 15% increase in internet usage during the Coronavirus pandemic. The primary usage was online activities by educational institutions and businesses, and the work from home policy adopted by individuals and organizations. In addition, there was a 45% increase in home voice calling minutes usage among the general population.[9] This pandemic crisis provided an opportunity for innovative projects and ideas that would not have been executed otherwise, particularly in lower-middle-income countries (LMICs) such as Bangladesh[10] and India.[11] LMICs have a weak health care system, with many people living below the poverty line without access to primary health care. Telemedicine is a potential medium in LMICs to provide adequate care for chronic illnesses such as diabetes and hypertension, infectious diseases, pediatric and reproductive health, and to limit inpatient care, monitor adherence, encourage self-care, and improve health outcomes due to the widespread useof smartphones, SMS messaging, and automated calls.[12]

Rationale for this review

Health systems all over the world are faced with challenges that are becoming more complex and call for the generation and synthesis of knowledge. Thus, fewer literature were available for country Pakistan.[13]

In addition, policymakers need reliable evidence to support decisions that must be made about the coverage, quality, efficiency, and equity of health systems. There are limited number of studies available specially from LMICs, which faced disproportionately higher impact of pandemic. The goal of this review was to identify the implementation and functioning of different types of telehealth interventions that were/are being used during CVOID-19 pandemic in Pakistan. This review will provide evidence on implementation of telehealth interventions to cope up with the challenges posed by COVID-19 pandemic in LMICs. This will also provide the audience a lens to view the potential of digital health systems to handle various health issues and natural disasters effectively and rapidly.

We also highlighted the knowledge gap of telehealth health initiatives at government level and its impact. Finally, we proposed strategies to enhance the telehealth service at public level based on the review findings.

Methodology

Search engine

We developed this article by mapping existing telehealth initiatives to build a database. Based on our data, we identified the initiatives using online portals including Google Scholar and PubMed. Moreover, websites of various government agencies and non-government organizations (NGOs) were also included.

Search strategies

Medical Subject Headings (MeSH) were used: COVID-19 OR SARS-CoV-2 Infections OR covid-19 OR 2019 Novel Coronavirus Disease OR 2019 Novel Coronavirus Infection AND Telemedicine OR Telehealth OR Telecare OR Mobile Health OR mHealth OR electronic health, OR eHealth OR digitalization OR digital health AND Pakistan.

Eligibility criteria

Telehealth or Telemedicine initiatives, initiated during the COVID-19 pandemic to address challenges posed by pandemic in health sector of Pakistan.

Extraction of data

Selected articles were reviewed, and information were extracted on study settings, population, intervention (screening, contact tracing, consultations, counseling, training of providers, etc.). Similar information was extracted from the websites of included interventions/organizations.

Findings

Search outcomes

Altogether 23 sources were identified, which included 16 research papers and seven government and NGOs websites for this narrative review according to the eligibility criteria.

Thematic analysis. Figure 1 provides an overview of the various telemedicine services provided during the COVID-19 pandemic in Pakistan. The services are divided into different categories, including teleconsultation and follow-ups, online registration for vaccines, dissemination of information, tracking of high-risk subsets, virtual training of health care workers and medical students, and tele-psychological counseling
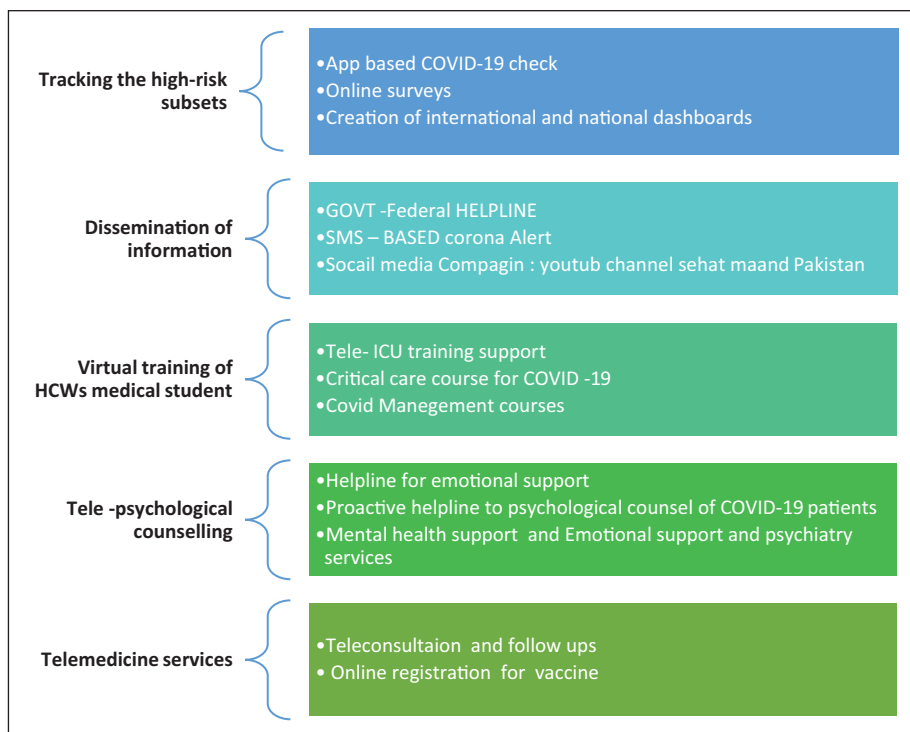
Figure 1. Usage of telehealth to mitigate COVID-19.

(Refer to figure 1). In the teleconsultation and follow-ups category, the services offered are online registration and follow-ups. In the dissemination of information category, the services provided are the federal helpline, SMS-based Corona alerts, and a social media campaign on the YouTube channel "Sehat Maand Pakistan." In the tracking of high-risk subsets category, the services offered are app-based COVID-19 checks and online surveys. The virtual training of health care workers and medical students category includes tele-ICU training support, critical care courses for COVID-19, and COVID management courses. In the tele-psychological counseling category, the services provided are helplines for emotional support, proactive helpline for psychological counseling of COVID-19 patients, and mental health support and psychiatry services.

Public dissemination of information related to COVID-19 infection

The public sector played a vital role in disseminating COVID-19 pandemic information about the burden of disease, risk factors, and preventive measures. A number of strategies were used such as; text messages, replacing ringtones with an awareness message to the caller about the dangers of COVID-19 and the importance of the COVID-19 vaccine,[5] Punjab GOVT-Federal HELPLINE,[14] public awareness video for the general population,[15] and COVID-19 information platform.[16] Social media–linked chatbot was also developed, which helped to track the spread of misinformation regarding pandemic among the population.[17]

Tracking the high-risk group likely to be infected with COVID-19

Telehealth supported the health care system to find and track suspected COVID-19 cases. These strategies were used by both public and private sectors and included; App-based systematic Corona Check, a Web-based symptomatic checker,[18] COVID-19 self-screening tool,[19] and COVID-19 online surveys.[20] Furthermore, statistics were tracked through helplines and Corona Tracker dashboard Pakistan, which helped understand the spread of the disease and implement smart lockdowns. Additionally, Pass track application and webpage were also developed to register people traveling to Pakistan from outside.[21] Dashboards were created by the public sector,[22] and WHO also shared weekly situation reports and created an online dashboards that visualize and show progress.[23]

Training of health workers: ongoing education tools for HCWs and virtual meetings

Training of health workers was widely done using the electronic systems. Health care organizations conducted virtual training to prevent the exposure of health care workers and utilize resources efficiently, especially in remote areas.[24] Ongoing education for health care workers using eHealth helped strengthen the connection among different knowledge platforms and improved access in remote areas. Furthermore, this also improved the relationship among the health care workers.[25] In this

COVID-19 pandemic, online training and virtual meetings were also carried out by using the Internet/mobile in most medical universities, including virtual training of Health Care Workers and medical students, Tele-ICU training, and critical care course for COVID-19 in public–private partnership.[26]

Tele-consultation systems and mobile applications to support COVID-19 patients

The well-established use of telehealth is bridging gaps between client and provider through online consultations. A study showed that the providers and clients reported ease in communication and access to care, strengthened relationships, and reduction in cost of services, and perceived telehealth to provide better care and ensure continuity of services.[27] In Pakistan, application-based online organizations expanded their teleconsultations to cover more people by collaborating with different stakeholders.[16,28] Furthermore, these initiatives by the private sector supported the public sector, either free of cost or subsidized cost of teleconsultations in response to COVID-19. In addition, it created a significant influence on increasing the utilization of online consultations.[29] Moreover, some tertiary care hospitals also initiated teleconsultations to provide timely care and avoid large gatherings at hospital sites.[30] A study reported high service satisfaction of telemedicine users among people of Pakistan during COVID-19 pandemic.[31]

Psychological counseling and support to mitigate fear of outbreak

The health care system also provides psychological counseling and support through technology. The pandemic came forth with a high mortality rate from the viral infection and a huge mental burden and financial catastrophe in the world.[32] The COVID-19 outbreak has a high potential for psychological fear. It may result in many psychological problems such as fear, anxiety, stigma, prejudice, and marginalization toward the disease for all segments of people ranging from healthy to at-risk individuals to care workers. Coronavirus cases are vulnerable to both the direct effect of the disease and mental health problems—worriedness, fear, grief, and trauma.[33] Few private organizations addressed emotional support for the psychological counseling of COVID-19 patients and some initiative to control mental health problems for the population by using medium of mobile health.[34,35]

Discussion

Telehealth played a vital role in improving accessibility of care, quality of care, and cost-effectiveness in remote and underserved areas of Pakistan during COVID-19. Our findings also suggest that telehealth helped improve

mental health in the community through online counseling and consultations. In the United States (California), telehealth offered opportunities for accessing outpatient and mental health counseling through training clinicians[36] and using telehealth for communication (Public Care Message COVID-19). The United States has created Tele or electronic intensive care units (e-ICU) using two-way cameras, video monitors, and microphones.[37] Apple health check app, which serves as an information and screening portal, was developed in collaboration among Apple, the CDC, the White House Coronavirus Task Force, and Federal Emergency Management Agency (FEMA).[38] Sri Lanka developed a digital app for tracking and surveillance of COVID-19 cases.[39] Most countries developed dashboards to collect and provide real-time data on COVID -19 and relied on online platforms for the identification of exposed populations such as WeChat (called Weixin in China; Tencent Inc), Alipay, and QQ, and contact tracing used in China. This collaboration has been made with the telecommunication industry to promote these strategies at the national level in China.[27] African countries used it for field data collection of COVID-19-related information.[40] The WelTel virtual care system helped as a real-time platform for monitoring COVID-19 patients.[41] Furthermore, in response to the COVID-19 pandemic, telehealth has provided a medium to liaison between the global technology diaspora and enterprises.

Telehealth initiatives provided an implementation platform to reduce the effect of COVID-19. Our study finds that during COVID-19, the public and private sectors played a vital role in disseminating COVID-19 pandemic information among the Pakistani population by texting warnings about the disease burden, risk factors, and prevention steps. The health ministry replaced ringtones with an awareness alert to the caller about the risks of COVID-19 and preventive massages to raise population awareness and engagement.[5] A similar strategy was used in Africa, where text messages were forwarded to mitigate the spread of COVID-19 through the DHIS COVID package all over Africa.[42] Telehealth was used well throughout the world during this pandemic, but digitalization implementation opportunities were overlooked in previous pandemics, notably the 2009 H1N1 "Swine Flu" outbreak.[43] The number of mHealth innovations has increased during Pandemic, for example, in Liberia, Ushahidi's software company created a mapping tool to track the disease's progress.[44] At the initial phase of the Ebola outbreak, a CliniPak mobile health system was used to support mother and child health by disseminating information on Ebola and its management to health care providers.[45] Furthermore, this system was also used to provide training to the medical staff.[46] Telehealth has been used to track clients by registering their phone numbers, name, and ID to decide if they have come in close contact with the confirmed or suspected case. This helped public and private sectors and researchers to use telehealth to strengthen health system

response in the era of COVID-19. The findings of this review might be applicable for other similar countries with weak health care systems.

Knowledge gap on impact of telehealth during COVID-19

There is a need to grab policymakers' and researchers' attention to evaluate the impact of telehealth on COVID-19 response in public and private institutes. Furthermore, telemedicine has the drawback that physical examinations, laboratory testing, and radiographic examinations cannot be conducted electronically. Many surgical and orthopedic treatments cannot be done without a hospital stay. Patients are hesitant to use it since it is a new and unfamiliar/unconventional practice. Additional issues include; lack of knowledge, access to communication networks, and awareness. Defining the obstacles and facilitators for health professionals and patients is the most challenging task for future studies in telehealth usage. This includes understanding how telehealth has affected access to care, patient satisfaction, and the quality of care received. In addition, the long-term impact of telehealth on health care systems and the health care workforce also needs to be studied. To address this knowledge gap, it is important for researchers to conduct in-depth studies and evaluations of telehealth programs and services implemented during the COVID-19 pandemic. There is a need to study the impact of telemedicine solutions on efficiency indicators and hospital performance during crises such as COVID-19 in the future. Its usability by the general public is further limited by the availability of education, communication network availability, and awareness.[47]

Proposed strategies to enhance the telehealth service at public level

There is a need to educate the general population about use of web pages, journals, magazines, and social media platforms like Facebook, Instagram, and Twitter. Health experts and others publicize and debate health standards and governmental mandates, and how they should be used. We also found that integrating telehealth through local organization can help improve service delivery and proved as a public health approach. However, there is also need of large-scale studies of telehealth services in different settings and countries. At the patients' level, there is massive need to educate them about using mobile phones, especially use of mobile application for availing health services.

Assess the efficacy of telemedicine through post-pandemic disease surveillance

Research is needed to assess the efficacy and effectiveness of telehealth approaches in several health domains,

particularly post-pandemic disease surveillance. This technology is also highly recommended in psychiatry because it cuts in-person appointments. Other future studies could focus on assessing patient satisfaction, provider satisfaction, and usability of telehealth in supporting health care systems during crises.

Implication of telehealth in to COVID-19 as a public health approach

The COVID-19 pandemic has resulted in a paradigm shift in health care procedures, leading to the implementation of innovative solutions to bolster health care systems. In the face of the pandemic, telehealth has been embraced as a systems approach to health care to address not only the virus but also the impact of new social and ecological transformations on individuals, communities, organizations, and policymaking. Telehealth has played a critical role in supporting the response to the pandemic by offering a range of services to assist with combating the spread of the virus. These services include contact tracing and geotagging high-risk individuals and populations, accessible care options through telemedicine and tele-counseling, promoting holistic health literacy through awareness messages and social media campaigns, and facilitating the adaptation of telehealth platforms and public–private partnerships linked to policy to provide access and coverage to the population to mitigate COVID-19. Furthermore, it has highlighted the importance of telehealth as a systems approach to health care, and the need for continued investment in telehealth technologies and infrastructure to support and enhance health care systems. Telehealth has been critical in providing a range of services to address the impact of the pandemic, and in promoting community resilience against the spread of the virus.

Limitation of the review

In this narrative review we included both peer reviewed literature and other general sources of information on telehealth interventions implemented in Pakistan during COVID-19 outbreak. However, the available literature focused on the implementation of these intervention with no information on impact of these interventions in terms of population reach, utilization, and health outcomes. Nonetheless, we mapped the extent of and solutions provided by telehealth intervention during COVID-19 pandemic in a developing country

Monitoring of digital information

In this context, the monitoring of digital information has become increasingly important. This is especially important during a pandemic when accurate information is critical for reducing the spread of the virus and protecting public health.

The widespread use of digital technologies has led to a proliferation of digital health platforms and social networking sites that serve as important sources of information. These platforms are widely used by people looking for the latest updates on the pandemic and guidance on how to protect themselves and their families. However, with the rapid spread of information, it is essential to ensure that this information is accurate and reliable to prevent spread of false information. Law enforcement officials should hold individuals accountable who spread unproven beliefs. This includes individuals who spread conspiracy theories or false information about the virus and its transmission. Holding these individuals accountable will help to promote accurate information and reduce public fear and confusion. In addition to holding individuals accountable, live broadcasts of health news briefings and media interviews can increase public awareness and reduce pandemic-related fears. These broadcasts provide the public with up-to-date information about the virus and its spread, as well as guidance on how to protect themselves and their families. By providing accurate information in real-time, these broadcasts help to dispel false information and reduce public anxiety.

Conclusion

The COVID-19 pandemic has brought enormous difficulties to health care services worldwide. In response to these health and social crises, telehealth interventions have been implemented to provide innovative solutions. Health care organizations should aim to expand these telehealth services and make sure they are delivering medical care that is both effective and safe. This includes improving service delivery, setting up reliable surveillance systems, and providing telehealth services to the public for the dissemination of information related to COVID-19. However, to establish the suitability of these telehealth interventions for future use, it is necessary to conduct further research to assess their impact and effectiveness. This will enable health care systems to be better equipped to handle public health emergencies like pandemics in the future.

Declarations

Ethics approval and consent to participate

The article does not require ethical approval from a committee or review board because it contains no human/animal study data or confidential information.

Consent for publication

Not applicable.

Author contributions

Rawshan Jabeen: Conceptualization; Formal analysis; Visualization; Writing—original draft.
Unaib Rabbani: Conceptualization; Formal analysis; Methodology; Writing—review & editing.

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