Chapter 3

Role of mobile health in the situation of COVID-19 pandemics: pros and cons

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3.1 Introduction

The impact of the disease caused by a novel coronavirus (2019-nCoV) generalized as COVID-19 is affecting each nuke and corner of the world with more or less similar complications. The disease is reported to affect more than 4 million individuals, tainted by the infection so that COVID-19 limitations are applied to the everyday life of people worldwide (Worldometer, 2020). The measures taken to decrease the spread of novel coronavirus or forestall contamination followed the cleanliness with sanitization rules (Chen et al., 2020). The most significant precaution is washing hands many times a day to slow down the spread of the infection at the social orders with maintaining social distancing (Nakada & Urban, 2020). There was a global level of lockdown that has been witnessed. Researchers have declared that lockdown is a temporary solution to limit the spread of infection in developing and developed nations equally (Tobías et al., 2020). In support of the statement, approximately 214 nations announced the total number of affirmed COVID-19 cases in their country daily (Chakraborty & Maity, 2020). Governments have taken severe limitations to be followed by the population, such as declared holidays for schools, work from home culture for offices, quarantine period for the containment zones those has high number of cases, and lockdown to stop the COVID-19 flare-up. The lockdown days were with variable in different nations decided by the local authorities to limit the COVID-19 impact on the population. A few nations have increased the lockdown time-period by numerous days due to the COVID-19 effect on general society. Some of the governments continued the lockdown until this report.

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However, the last day of lockdown in many countries was witnessed as on May 5, 2020, with a remarkable example given by Ireland, with a curfew for 68 days, which has the most extended lockdown period during which a total of 21,000 COVID-19 cases were approved till May 5, 2020. Due to the highest number of cases in Spain, it has been imposed with a lockdown for 53 days (Chen et al., 2020).

During the lockdown period, a severe impact has been witnessed on all the sectors along with the healthcare delivery system, as the general public has been advised to stay indoors and not to visit any social place including clinics, hospitals, dispensaries, public healthcare centers, community health centers, and so on (Kasthuri, 2018). In this context, the patients who were planned with surgeries were faced with problems and were in a queue of routine check-ups. To take a way out of this, several online platforms, by the aid of software, came up with the solution for virtual patient – doctor meetings as a part of the popular term mobile health, which can be a future way to improve the value, proficiency, viability, and responsiveness of the healthcare frameworks to be ready for emergency management, remote consultation etc. as shown in Fig. 3.1.

The role played by mobile centers ought to give the proof to legitimize arrangements that will empower the ideal incorporation of mobile facilities into any mobile health (mHealth) care delivery framework (Attipoe-Dorcoo, 2018). With national endeavors for social determinants of good health, there is presently, like never before, the need to consider firm government policies

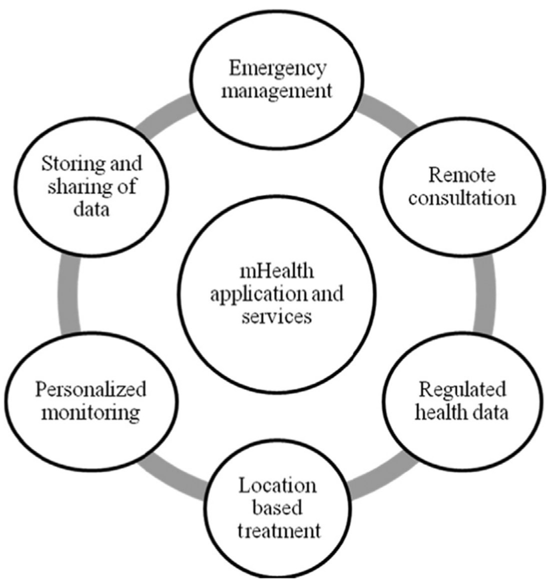

FIGURE 3.1 Different jobs performed by the mHealth application and services.

for mobile healthcare facilities. Even though there are current financial hindrances faced by the population of developing nations tending to well-being, weak patient care results will likewise assume a job in adding significant worth-based installment models (Malone et al., 2020). There are impermanent administrative exemptions that have been made by the Centers for Medicare and Medicaid to repay the utilization of apartments as emergency clinics to help with the attempt to battle the COVID-19 pandemic (Muchmore, 2020).

3.2 Implementation of a training module for the mHealth care worker

Effective utilization of any new technology is only possible when there is a critical learning process at ground level. mHealth is a new scientific innovation for many developing nations, in terms of medical curricula, and there is a lack of adequate understanding about when and how it works (Moore et al., 2017). It has been observed that there is a severe shortage of qualified technical skilled individuals in both developed and developing nations for mHealth. They are facing considerable challenges in identifying and developing technical skills to those individuals. American Medical Informatics Association took the initiative by launching suitable graduation programs like short courses, a project-centric model to provide healthcare practitioners training specifically for developing countries like India, Africa, and Latin America (Hersh, 2008).

mHealth requires implementing academic models with appropriate teaching structure in digital communication skills, deployment of telehealth products and services, and knowledge of the regulatory and legal issues (Slovensky, Malvey, & Neigel, 2017). Even educational institutions presume that clinicians should learn mHealth skills as a part of their regular curriculum. Current medical graduates are considered as "digital natives," the reason being they are familiar with technology and could implement skills into their professional practices to contact and examine patients (Malvey & Slovensky, 2014). The generation can be considered the first generation of medical graduates ideal for incorporating innovations in health care. Examples have been set by the advanced degree program, launched with a partnership with the local universities and its healthcare delivery system, funded by Bill & Melinda Gates Foundation https://www.amia.org/GPP (https://www.amia.org/education/programs-and-courses). Technological expertise improves healthcare efficiency, safety, and reduced costs (Hersh, Margolis, Quirós, & Otero, 2008).

The practical exercises for skill enhancement programs include developing health informatics applications, advancing wellness computing tools, and data science. The research examined the association between specific practical skills training and user's mindset in adopting technology (Sapci, 2019).

E-platform like mHealth apps have a broader scope than in-person healthcare management as it has a greater reach among the users, and dependency on physical travel is nullified. The Accreditation Council for Graduate Medical Education organized several programs that include seminars, case-based learning, teaching, administration, assessment, and upgrading quality in health management to par with conventional health diagnostic. A significant paradigm shift is required in building a productive e-platform in the healthcare system through significant improvement in the technological skills of both medical professionals and the patients. The technological skill helps to handle the mHealth and Smartphone apps help to achieve the goals of providing healthcare at doorstep (Hilty, Chan, Torous, Luo, & Boland, 2019). While designing the program, if the algorithm initially provides the terrible results, it will have adverse effects on health-related outcomes and user engagement. To avoid adverse effects and harmful results, it is better to consult a mobile device specialist (Guha, 2018).

3.3 Government policies for the scale-up of the mHealth services

As mobile clinics can be significantly chosen for the service conveyance, particularly after a debacle has caused fixed offices to close, this care model has not been generally supported earlier (Rassekh, Shu, Santosham, Burnham, & Doocy, 2014). It has been proposed by three general ways to deal with the upgradation of mobile clinics programs and their framework in complete combination. The first place has to be perceived by the financial commitment for the mobile center projects meant for the human healthcare services. The mobile clinics offer some benefit to the general population residing in the rural and urban regions by offering a network as far as forestalled visits to the emergency services. To evaluate such advantages, there is significant work to be finished (Hill et al., 2014). In connection it is important to investigate mobile clinics' economic effects in terms of the three checkpoints: first of all the decreased per capita normal expenses of care, advantages to populace well-being, and upgrades intolerant fulfillment. Through this perspective, we will have the option to work with policymakers, suppliers, and payers to characterize suitable repayment plans for mobile facility program administrations.

Second, it has been accepted that a particular government financing project ought to be designed to give required financial support that will permit both the development and extension of the number of versatile center projects. This will not only guarantee that the facilities are promptly fused into the current medicinal services framework, but also crisis readiness. A case of how to make such an arrangement realistic is by considering versatile centers on the administration models proposed in the national COVID-19 observation framework (McClellan, Gottlieb, Mostashari, Rivers, & Silvis, 2020).

These models are proposed to expand the limit of treating patients in detachment offices, incorporating portable well-being facilities through disease, and recuperating patients. These endeavors will be fruitful with improved government repayment models that spread network-based assets, just as state what is more, neighborhood well-being coordination (McClellan et al., 2020). Setting up these frameworks presently, as shown in Fig. 3.2, will likewise fortify general well-being and human services readiness for future flare-ups on the different levels, which can be a government, public initiation, or a private company-owned business model based on symptoms of tracking, information sharing, or follow-up basis.

Third, it has been proposed that making national subsidy schemes on the public – private partnership model can help to give support to the existing model to serve better. This will permit versatile center projects to set up close shared contributions with different partners in the human services framework. For instance, repayment for mHealth is innovation in versatile facilities, and the capacity to allude and explore patients in a far-reaching constant way. This methodology, in blend with Geographic Information Systems (GIS)-based course streamlining calculations, could be utilized to decide the need for territories, particularly country zones where fixed offices are shutting at quick rates (Attipoe-Dorcoo, 2018). In addition, the turn of events of online applications is dependent on information gathered through the mHealth Map, such as in the case of the program of Harvard Medical

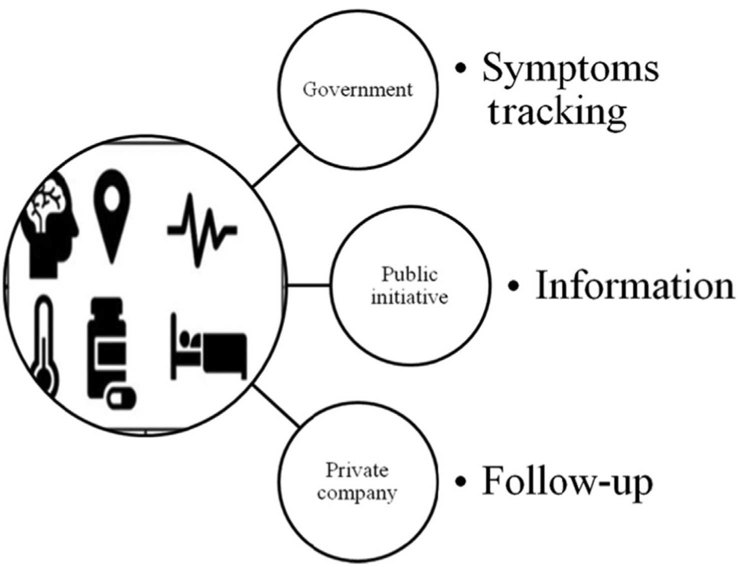

FIGURE 3.2 mHealth care management at three different modes to serve the population. *mHealth*, Mobile health.

School's Family Van, which has been utilized by state authorities to guide versatile facility assets to divert toward zones of high need. Existing geographic calculations could be utilized to decide such areas of need, and the versatile facilities could be utilized to arrive at populaces effectively. Moreover, existing proportions of the more extensive scope of network need could help direct portable facilities to networks needing anticipation administrations, just as address the issues of imbalance experienced in numerous underresourced networks (Farmer, 2020).

3.4 Popular models of mHealth serving for pandemic COVID-19

The World Health Organization characterizes mHealth as: "medical and public health practice supported by mobile devices, such as mobile phones, patient monitoring devices, personal digital assistants and other wireless devices." The developing prominence of cell phones in social insurance has been offered to the Mobile Health, or mHealth, industry during COVID-19, as reported in Table 3.1. Fueled by advancement and expanding networks worldwide, mHealth innovation is developing at an incredible rate. For instance, in 2018, there were less than approx. 3 lakh health-related applications accessible for download, practically twofold the number of applications on the top application stores in 2015. It is considered that the versatile human service innovation advertises getting a charge out of enormous achievement and is anticipated to arrive at an estimation of €53 billion by 2020 (Franco, 2015).

3.5 Ethical consideration

Due to various reasons, mHealth became more popular in the past few years, spreading as a practice working style for doctor-to-doctor frameworks in numerous countries worldwide over all asset levels (Blom, 2018; Thomas, 2018). However, it presents specific moral concerns (Sharp & O'Sullivan, 2017). Concerning media data used for interactions, clinical pictures are communicated or distributed without having either the clinician or the patient utterly mindful of the break-in only security glitch that may happen (McCartney, 2018). In addition, the utilization of clinical pictures coupled with the online meeting is equivalent to telemedicine, which is continuously developed and designed. There are works in shields for securing the dispersion and capacity of the clinical records that online networking does not give.

Further, sometimes clinical pictures at this point exclusively, if not taken by proficient professionals at the same time, may need explicit capability (Palacios-Gonzalez, 2015; Sharp and O'Sullivan, 2017). Suggestions to alleviate concerns relating to the moral standards of self-rule, well-being, and equity are accessible in analytical writing and proficient rules, such as medication, nursing,

TABLE 3.1 **Most popular web-based applications for COVID-19.**

Geographical location	Application	Features
Singapore	https://mothership.sg/2020/03/trace-together-COVID/	It does not collect any other personal data or location data (GPS, Wi-Fi, cellular networks) but is used for tracing.
Israel	https://medium.com/@oleiba/hamagen-fight-coronavirus-and-preserve-privacy-b1631693bb46	It detects a sick person's location. Notifies the user and provides him with the updated instructions.
Austria	https://participate.roteskreuz.at/stopp-corona/	The infected person triggers the warning of close contacts after medical confirmation of infection past 54 h.
Bulgaria	https://coronavirus.bg/arcgis/apps/opsdashboard/index.html#/ecacd239ee7e4fba956f7948f586af93	Real-time link between citizen's authorities and the healthcare system.
Iceland	https://www.covid.is/app/en	Contract tracing app "Ranking C-19" helps to analyze individuals' travel and trace their movements.
Cyprus	http://covid-19.rise.org.cy/	An application named TRACER for racing of location.
Czech Republic	github.com/covid19cz/erouska-androidandgithub.com/covid19cz/erouska-ios	Bluetooth proximity tracing app, created by the covid19cz, endorsed by the Ministry of Health. The app uses pseudonymous IDs; the phone's data are provided to the central system only with explicit consent.
France	https://www.servicepublic.fr/particuliers/actualites/A13927%20follow-up%20of%20COVID-19	Software that analyzes the COVID-19 symptoms. Medical survey is sent to patients every day

(*Continued*)

TABLE 3.1 (Continued)

Geographical location	Application	Features
Germany	https://experience.arcgis.com/experience/478220a4c454480e823b17327b2bf1d4	
Ireland	https://www.hsecovid19.ie/	Data sharing of COVID-19 health information of a patient during self-isolation.
Italy	http://www.regione.lazio.it/rl/coronavirus/scarica-app/ https://www.dedalus.eu/dedalus-per-covid-19/	Telehealth and monitoring with a general practitioner in Lazio region, screening, active surveillance at home, tutorial, chatbot, telehealth.
India	https://www.aarogyasetu.gov.in/	The contract tracing app helps to analyze travel and trace the movements of COVID patients.
The Netherlands	https://apps.apple.com/nl/app/covid-19-medisch-dossier/id1502322865	Public information app with Q&A, phone numbers, and map of the Netherlands locating infections.
Norway	https://helsenorge.no/coronavirushttps://www.simula.no/news/eng-simula-working-Norwegian-institute-public-health	To monitor the spread of the infection and to assess the effects of the infection control measures.
Poland	https://www.gov.pl/web/koronawirus/wykaz-zarazen-koronawirusem-sars-cov-2	Contact tracing and self-diagnostic app.
Portugal	https://covid19.min-saude.pt/ or https://www.sns24.gov.pt/	Tracing app but on promotion, monitoring, and self-care.
Spain	https://covid19.es/	Chatbot using AI and Natural Language named Hispabot-Covid19

(*Continued*)

TABLE 3.1 (Continued)

Geographical location	Application	Features
Brazil	https://play.google.com/store/apps/details?id = br.gov.datasus.guardioes&hl = en	Symptoms, how to prevent, what to do in case of suspicion and infection.
Vietnam	https://www.opengovasia.com/vietnam-launches-health-app-to-manage-COVID-19/	Citizens can update their daily health status and provide information.

or designing (Albrecht & Fangerau, 2015; Carter, Liddle, & Hall, 2015). The piled up data are disaggregated only from time to time as per the phases of mHealth applications (advancement, assessment of adequacy, execution, and scale-up). Their acknowledgment over a scope of partners is unsure; their low-asset settings have gotten constrained consideration (Cresswell, Bates, & Sheikh, 2013). The examination expects to fill those information holes by researching what partners from various settings and foundations concur and organize to handle self-sufficiency, security, and equity concerns. Issues around unapproved or vindictive access to sensitive information were much considered in mHealth's ethics, especially in current circumstances (Kotz, Gunter, Kumar, & Weiner, 2016). In any event, when well-being information is put away on HIPAA (Health Insurance Portability and Accountability Act of 1996)-compliant workers, essential prominent hacks uncover that the data are as yet powerless against bargain (Peterson, 2016). The information gathered by mHealth applications might be weaker still, as the versatile sensor or nearby information stockpiling is typically worn or conveyed by the patient or subject. Like regular stockpiling of human services information, mHealth innovation ordinarily depends on cloud figuring, and rehashed hacks have exhibited that cloud stockpiling is a long way from being resistant to security penetration. Dissimilar to ordinary stockpiling of medicinal services information, mHealth innovation necessitates that conceivably delicate well-being data are gathered or put away at the gadget level. For instance, patients not utilizing mHealth innovation may have psychological sickness insights in their clinical records, especially during pandemics.

Patients who are well-versed of use of mHealth innovation to screen their psychological sickness indications will at present have the judgments and treatment plans put away on a data cloud. However, now they will likewise have new classifications of delicate and individual data on their cell phones, for instance, and this presents another degree of hazard. The guarantee of expanding availability to social insurance meets a few more difficulties. For instance, mHealth intercessions like the ones depicted above, utilizing instant messages, may not reach the individual need care, either in light of the fact those are ignorant, or neighborhood dialects are not bolstered by versatile phones (Bullen, 2013).

On the other hand, applications require cell phones with a quick web association and capacity to connect with these telephones, in this manner barring specific gatherings (e.g., low-pay gatherings or older individuals with less expertise with cell phones). These issues bring up the confusion of whether the individuals who need better consideration or improved access to mind at present are being served by mHealth advancements. These angles undermine the guarantees of availability to healthcare services and raise issues whether mHealth intensifies instead of mitigating social equity issues.

3.6 Superiority of mHealth services over other available services

mHealth devices and applications help in therapeutic progress compared to conventional treatment due to the diagnosis of illnesses. Documentation/billing is perceived as an unregulated burden generated by an increased number of patients in hospitals. The mHealth applications and their usage reduce patients' movement to the hospitals and help medical representatives document their disease treatments through a simple yet effective structure (Zeman, Moon, McMahon, & Holley, 2018). Millions of medical representatives supported the growing technological developments in health care, and the implementation of voice-interactive tools is one of them in the everyday lives in patient's treatment. Voice-interactive tools are anticipated as a long-term practical solution in home documentation and delivery of information, which helps in saving time and extra costs. The importance of health information outside the hospital generated at home is a big resolute to the medico personnel. On occasions, the patient's admission and discharge is a big challenge for clinical supervision. The recommendation of voice-interactive tools not only improves record maintenance but also helps in communicating with different patients, care providers, and caregivers as technological solutions in telemedicine setup (Sezgin et al., 2020).

Rigid contamination control of transmissible diseases such as COVID-19 is a basic necessity at treatment centers, among the specialized isolating amenities where patient's treatment has been done. Major obstacles have been faced previously, was poor documentation and examination of patient's record as seen case of Ebola pandemic in West Africa during the year 2014−16, where paper-based information at Ebola treatment centers was a proven failure in the documentation of patient's information in terms of volume, quality, and secrecy. The electronic mHealth framework can tackle these challenges, including implications for medical treatment, monitoring, and analysis. A software named as OpenMRS Ebola was used for tracking patient's information (enrollment, bed allocation, and discharge); documentation of critical signs and symptoms; scheduling and evaluation of prescription; test results; doctor's observations and facts in contagious areas (Oza et al., 2017). mHealth apps have recently accelerated job allocation techniques with patient care, particularly in low and middle-income countries. Fewer studies address user-friendliness and practicable difficulties that might affect the future direction, and few were implemented for noncommunicable diseases such as hypertension. In Western Kenya, the DESIRE (Decision Support and Integrated Record-keeping) tool was developed to test the performance of its repetitive functionality to support rural clinicians in treating hypertension cases at the community level with limited resources (Vedanthan et al., 2015). In other cases of diseases, which requires maintenance of data about the lifelong history of patients, as in the case of thalassemia (genetic blood disorder), many challenges have been faced by Malaysia's public health management personnel due to lack of technological skills by the users to monitor the frequent monitoring checks that the patient is supposed to undergo. During their lifetime, regular supervision of patients needs modern technological development to improve the efficiency and effectiveness to achieve success in thalassemia treatment. mHealth where smartphone plays an assistive role because of its ubiquity and accessibility as a personal device that can support users (patients, care professionals, and clinical) in treating thalassemia disease and position as a way that comes between patient and doctors in health management (Bal et al., 2014).

Therefore, it is essential to have a convenient yet effective patient health-related data capturing mechanism for subsequent utilization in clinical analysis of diseases and tracking parameters for observing trends and patient health changes. Documentation of treatment is thus the pivot point for the successful evolution of mHealth application as it proves to be cost-effective and less time-consuming utility as a medium of interaction between the patient and the medical personnel.

3.7 Probability of conflict of interest between user and service provider

Multifold utilization of mHealth applications is possible when in different health and fitness monitoring areas, the evolution of the mHealth applications occurs with equal consideration of both the end-user and the application developers or creators. At the interface, it seems a visible and transparent domain; however, considering the magnitude of data, there can be implications on developing a business ambition around the quantum of information through unverified and, at times, unethical channels or mechanisms that help to multiply revenue-generating sources.

More often, most of the mHealth applications available on multiple platforms have a potential to influence the user behavior by increasingly compelling ways as these applications not only influence the health patterns of patients but also the economic behaviors emerging from the culmination of both health and commercial content in ways those are significantly challenging to detect and have a trace upon. Hence user autonomy can be impacted by unfair commercial and ethical practices. Therefore it is essential to evaluate the user expectations from mHealth applications regarding possible benefits from the applications' usage, hence enabling mHealth applications a preferred consulting channel for the global mass. The patient's expectations are as per

1. Conscious information: thoughts, perceptions, beliefs, etc.;
2. Preconscious information: memory, past experiences regarding a particular illness and treatment;
3. Unconscious information: fears, selfish motives, instincts, etc.

The above factors make every patient distinctively unique, and therefore each one needs a customized resolution through a robust diagnostic experience (Boag, 2017). Patients' underlying expectation is to have a cost-effective, simple to use, and secure platform in cyber-physical space. From the developer perspective, the commercial aspect regarding the number of application downloads, review ratings, and extraction of users' relevant data for further analytics are the key imperatives.

3.8 Legal consideration

The legal consideration of data gathered during the diagnostic interaction between the patient and the professional is also a significant point of concern for most of the people who had chosen to interact on the mHealth platforms globally. Though the patient's health profile becomes accessible for the health professionals by one click away, it has some aspects of unwanted usage and data exploitation. More often than not, the interaction platforms used by either of the parties, that is, the patient or the medical personnel, have parallel access to multifold social networking zones, which at times might lead to the leakage of sensitive patient-generated health data in the social networks of either of the third parties in the data exchange.

To analyze the concern to understand the ownership of data at various levels of transit in the digital space by the elementary or so to say notional "Terms of Service" lays the foundation stone of data ownership across most of the social media channels and mostly has a well-defined statement of data ownership at the onset of an application before its full-fledged usage, predominantly in an mHealth scenario. As a preventative practice, the medical representatives or the doctors should first educate the patients for the mHealth apps at the very beginning, and warning signs for limitation of these apps should be flashed as an initial procedure (Yang & Silverman, 2014).

In general, these terms and conditions decide the usage of data in diagnosis. Hence, it is necessary to go through the same before the intended usage for patient-generated health data. Once a data repository is formed, at the mercy of the site or application owner, there is concern arises about how and when to use it. However, there are still specific provisions for the users in countries like the United States under the Health Insurance Portability and Accountability Act of 1996 (Petersen & DeMuro, 2015).

In most diagnosis cases through the mHealth platforms, professionals' treatment is conducted knowingly and unknowingly with cognitive bias. The reliability of data captured by the patient is also a gray area as far as accuracy is concerned. The patient-generated health data are mostly recorded by the patient, and there are chances of being erroneous data due to two conditions:

1. The physical well-being of the patient might not support him/her while recording the data.
2. Lack of skill or training to capture health data by the patient.

The above two constraints might well lead to data transfer with specific errors to the medical representative at the diagnostic end of the mHealth platforms. This might lead to a failure of judgment in the future course of medical action with the patient. Therefore it becomes undeniable that the patient's self-monitoring health app has to be judiciously working. It decides the subsequent treatment actions for the doctors or health professionals in the subject. Therefore in such cases where if one has to define the ownership of the medical personnel in terms of erroneous diagnosis basis, the inaccurate information provided by the patient becomes an area of legal intervention if the need arises. But, unfortunately, the on-date legal framework does not conclude much about the resolution of such scenarios where there is a discrepancy in data at the point of origin and the point of application.

3.9 Protection of privacy of end-users

According to HIPAA regulation Electronic Protected Health Information (ePHI) consists of 18 different demographic parameters to recognize a user. The creation of ePHI aims to store, receive, or transfer health information electronically, keeping in mind the security rules or standards set by HIPAA. Confidentiality ensures that without adequate patient authorizations, ePHI is not disclosed. Integrity ensures that ePHI is accessed by relevant and approved parties who come under the healthcare organizations. Availability permits patients' ePHI only if they follow HIPAA security standards. Examples of ePHI are name, address, email address, medical records, etc.

As mHealth applications' usage erupts in the global landscape, the need for assuring no pilferage of information gathered directly or indirectly during the interaction is of supreme importance. The nature of diagnostic requires a close interaction in the cyber-physical space and therefore has a potential risk exposure of valuable information to the domains unintended for future hazards. The potential risk can be bifurcated in privacy-related and security-related domains. Therefore various techniques and tools for assessing security and/or privacy need to be closely assessed and evaluated for mitigating risk and creating a robust platform for interaction (Nurgalieva, O'Callaghan, & Doherty, 2020).

The majority of applications developed globally are based on two platforms: Android or iOS, depending on the end interface available to the consumer and the service provider, thereby enabling an extensive data transfer back and forth between both the medical professionals and patients. Therefore the reliability of secure third-party servers and trustworthy internet communication services is a critical cog in the development wheel of the mHealth applications in terms of customer experience and effective treatment (He, Naveed, Gunter, & Nahrstedt, 2014). The significant transition of the physical way of diagnosing ailment to a diagnostic setup in a virtual environment would also need a safe and secure payment structure with a hassle-free experience for both the professionals and the patients; henceforth the need for secured payment gateways and online financial transactional support with monitoring and governing authority is also a must for the mushrooming of this setup.

Owing to the global upsurge usage of mHealth applications for diagnostics and treatments through a seamless virtual experience digitally, a well-defined sequence of procedures can be utilized as a ready reference for both parties involved for substantial benefit. It can be an essential document for problem resolution dealing with data privacy, security, and confidentiality concerns. Moreover, a precise cut formulation of guidelines would also enforce trust in the interaction, and this will further foster the bond between the professionals involved with the patients. On analyzing the various source points of data security, privacy, and confidentiality, one can conclude that there is a significant amount of overlap in the mentioned three areas. Hence, reasonable documentation is, therefore, also required to distinguish between the three (Bhatnagar et al., 2020; Singh et al., 2020; Spigel, Wambugu, & Villella, 2018).

3.10 Conclusion

There is a requirement for both creative- and strategy-based answers for pandemic and future healthcare delivery systems. mHealth care facilities are a crucial piece of the arrangements, and the present situation demands to perceive the more extensive potential for current and future healthcare emergencies. mHealth apps are technologically new and continuously improving day by day. It is necessary for graduate education and training to begin with the ethical and legal utilization of mHealth applications. In the present scenario of COVID-19, there is a requirement of constant and relevant training in mHealth apps. Training and supervision hold the key to scaling up of mHealth applications globally as it is continually improving process and the effort to be put up initially if very high and regular practice for usage at both supervision and patient-level is made.

3.11 Future prospects

Spread of several different communicable diseases has been witnessed every few years; overuse of medical drugs is one of the reasons for outbreak of pandemics such as COVID-19. A good networking and sharing of authentic information over a global healthcare system can provide a solution for early detection of such problems. If symptoms of every novel health problem are shared at the onset of disease, it can help the healthcare professionals to solve the problem on time. For this a well-developed health-care delivery system for emergency situations can save a lot of lives as well as money. The education system must include a well-designed mHealth curriculum as a mandatory course, along which training should be provided in terms of ethical and legal utilization of mHealth applications. Also, there is a requirement of constant and relevant training for mHealth apps for essential integrity, patient privacy, and proper arrangements as per the geographical locations. Health professionals should review the existing literature regarding the guidelines and support of the application for mHealth care. Clinically the health professionals must indulge in learning and discussion with those practitioners who are already practicing the mHealth apps in the medical care system. Clinical approval is required about the effectiveness, authentication, and usefulness of the mHealth apps for specific users at the community level. Experiences learned from previous crises strongly recommend the mHealth apps, which are well-designed, user friendly, and pretested by the clinicians for future needs.

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