A review of telehealth during the COVID-19 emergency situation in the public health sector: challenges and opportunities

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Abstract

Purpose – The purpose of this study is to provide current state of knowledge on how the COVID-19 emergency situation necessitated the behaviour influencing use and acceptance of telehealth. This study interlinks the health belief model (HBM) and the unified theory of acceptance and use of technology (UTAUT) to highlight the challenges and opportunities as a result of the COVID-19 pandemic in the public health sector.

Design/methodology/approach – This study used three online databases (Emerald publishing, Science Direct and Taylor and Francis) that enabled the authors to access electronic journal articles. Search strategy was used to extract articles based on the relevance of this study.

Findings – The key findings from this study suggested that the COVID-19 emergency forced health-care workers and their patients to rapidly use and rely on telehealth to reduce the rate of COVID-19 transmissions. The key benefits of telehealth use highlighted an expansive cost effective and convenient access to health-care services irrespective of geographical local and levels of physical impairment. Moreover, telehealth inhibited in person human interaction, which was perceived as impersonal and not ideal for new patient consultations. The barriers outweighed the benefits; as a result, it is unlikely that there will be a wide use of telehealth beyond the COVID-19 emergency situation.

Practical implications – The research findings are limited to discussions drawn from available secondary data. The criteria within telehealth for policymakers to note the technology acceptance and use for both health-care and outpatient stakeholders and their health seeking behaviour. Health-care sectors (private and public) and government need to understand enablers of effective telehealth in policymaking to ease the barriers during an emergency situation like a pandemic.

Originality/value – This study contributes to the emerging literature on how COVID-19 pandemic has disrupted and accelerated telehealth by extending both the UTAUT and HBM theories. This study is expected to contribute and expand literature on telehealth during emergency situations, given the novice nature of COVID-19 and limited literature surrounding it.

Keywords Telehealth, COVID-19, Human computer interaction, UTAUT, HBM, Health care, Usability

Paper type Viewpoint

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Introduction

Health affects all aspects of human life. As such, understanding utilization of health services is critical as it enables health promotion leading to a healthier society (Gurung, 2018). Gehlert and Ward (2019) alluded that access to health care is intersected by numerous factors at a structural level such as socio-economic determinants of health, quality of services and people's attitudes and perceptions. The utilization and access to quality services is also a basic human right, however Canham (2021) argued that the history of other pandemics in the global south has highlighted the social divide. Historically, health crises such as malaria, acquired immune deficiency syndrome (AIDS), tuberculosis (TB) and Ebola have ravaged communities in Africa because of inaccessibility to health services. At present, the early months of 2020 saw the novel coronavirus (COVID-19) rapidly evolving from a looming threat into a global pandemic and health crisis. COVID-19 has dramatically transformed health-care delivery across the globe. Health systems were forced to efficiently innovate in response to calls for social distancing, personal protective equipment conservation and health-care workforce preservation. One notable, innovation has been the use and rise of digital technology in the form of telehealth. Telehealth has been in the forefront of accelerating the delivery of health services internationally during the COVID-19 crisis (Monaghesh and Hajizadeh, 2020).

More evidence is emerging, and an increasing body of evidence is growing on utilization of telehealth during the COVID-19 pandemic. Recent literature on telehealth and COVID-19 focused largely on challenges (Bhatia, 2021; Helleman *et al.*, 2020a, 2020b), benefits (Nobleza, 2019; Sequeira *et al.*, 2020) of telehealth and various health-related services that telehealth was able to expand and make accesible (Miu *et al.*, 2020; Helleman *et al.*, 2020a, 2020b; Sequeira, 2020). Despite having several prior studies on telehealth during the emergency situations, there is still a significant lack of desktop-based evidence in terms of exploring literature on telehealth during the COVID-19 pandemic. As such, the purpose of this study was to understand how the COVID-19 emergency situation necessitated the behavior influencing use and acceptance of telehealth in the public health sector.

Telehealth

The availability and access to various advanced technologies continues to enhance how telehealth services are provided in society. Telehealth is broadly used to describe actual remote health-care services provided using telecommunication and other technology advances. Geller (2020) asserted that telehealth refers to the real-time use of electronics, such as smartphones and webcams that provide communication between patient and health-care provider, whereas Koohjani *et al.* (2019) describes telehealth as a way of relying on technology infrastructure to deliver health-care services. Sikka *et al.* (2019) concurs with Geller (2020) and Koohjani *et al.* (2019) by further adding that telehealth includes the use of technologies between the patient and health-care provider(s).

Recent studies suggested that the outbreak of COVID-19 necessitated strategies in continuing access to health care such as the use of Telehealth to help slow down transmission and increase social distancing (Barit, 2020; Geller, 2020; HPCSA, 2020). Video conferencing and similar television systems are also used to provide health-care programs for people who are hospitalized or in quarantine to reduce the risk of exposure to others and employees. Moreover, health-care practitioners who are in quarantine can employ these services to take care of their patients remotely (Geller, 2020; HPCSA, 2020; Monaghesh and Hajizadeh, 2020).

Telehealth and COVID-19 context

The adoption of telehealth in favorable settings where people have access to enabling resources can be beneficial. So, telehealth is essential in extending health-care services in a convenient way. As a result, telehealth plays an essential role in several settings where the virtual service can save lives. For example, Leite *et al.* (2020) point out that the use of associated technological tools that support telehealth can help save lives because of enabling a swift response rate by health-care providers. COVID-19 has increased the use and adoption of technology in providing services to communities. Telehealth practices are among the several effective ways of using technology to support servicing people. The key problems in developing countries are access, acceptance and the availability of resources to support digital health (Bali *et al.*, 2016). For instance, Bali *et al.* (2016) reasons that digital health may lessen the health-care service cost and the resources. The point raised by Bali *et al.* (2016) suggests that similar challenges are not experienced by developed countries.

The availability of advanced technologies does not mean health-care support has to change their current technology to use the latest as it often comes with a cost and requires adaptation, particularly if the used technologies are fulfilling their purpose effectively. The COVID-19 isolation and quarantine increased momentum drastically of telehealth services where it was already used and it presented opportunities to other health services to explore how technology can provide health services to society without physical contact. For example, Ben-David *et al.* (2021) are in agreement that the restriction of social isolation played an essential role in physical assessment tools for telemedicine.

The COVID-19 crisis social distancing and strict restrictions decreased physical contact and increased telehealth opportunities. Allowing health care to increase their virtual presence by using advanced technologies to support health-care services resulting in increased use of telecommunications to connect and share information. This is acknowledged by Head *et al.* (2013) stating that a large number of therapists find texting communication effective in connecting with families even though there are other technologies available.

Telehealth provides several benefits to the health-care sector, Leite *et al.* (2020) insist that there are also disruptive concerns that raise challenges for conventional health practices. For example, one may have to take into consideration sparsely populated areas and technology infrastructure distribution. Fronczek *et al.* (2017) point out that telehealth provides improved health-care services and support to the rural and sparsely populated areas, whereas Camden and Silva (2021) reason that telehealth is effective by pointing out that several health-care goals in different situations can be achieved. Similar telehealth solutions may not necessarily work in a different environment. As a result, Meyer *et al.* (2020) observe and question the long-term effect of the pandemic crises on the battling health-care support in rural and sparsely populated areas. Consistent access to internet connection and technology products may be limited in rural areas that have limited access to health-care services (Kleykamp *et al.*, 2020). Advanced technology use to support health-care services remotely may be a challenge in certain settings because of technology inequalities. Therefore, there is a necessity to address the socioeconomic advancement of rural livelihoods so that telehealth can be used to its full potential. Even though there may be an appetite for a wider implementation of telehealth to support and improve the current struggling health-care services, there are several concerns that should be comprehensively taken into consideration.

Though there are notable challenges, telehealth has evolved during the COVID-19 pandemic lockdown and accelerated new forms of digital innovation to further enhance the provision of services (Cox *et al.*, 2022). Safdieh *et al.* (2021) add that the growth of telehealth practice use in medicine was not necessarily triggered by the recent pandemic. This

suggests that the pandemic has further alleviated the growing pressure in ensuring that health courses include a component of telehealth so that graduates may be proficient in servicing society beyond the contact consultative sessions (Cox *et al.*, 2022; Camhi *et al.*, 2020). In support of the views expressed by Cox *et al.* (2022) and Camhi *et al.* (2020), Safdieh *et al.* (2021) add that medical student training in the telehealth space have been on the rise in recent years.

Yuce (2022) suggests that digital literacy, particularly searching for information has an indirect effect on eHealth literacy. Digital literacy skills are essential in ensuring that society is able to search for relevant health information effectively. COVID-19 has increased the number of people who search for health information in general compared to how there are experiencing. For instance, remedies for treating the symptoms were shared and disseminated using various telecommunications tools. Because of restrictions in movement and how the health sector was battling with understanding the COVID-19 at its inception, people relied on technology to educate themselves and also share information.

Treating patients remotely

The use of online platforms to provide health-care support continues to be embraced even though there are some challenges overshadowed by the benefits. For example, Priyadharsini and Chiang (2020) in their study carried out in Singapore looking at support for occupational therapy during the COVID-19 found that telehealth creates new opportunities for service health care and supporting communities even though it can be challenging as solutions had to be found instantly. Telehealth has been used effectively to address mental health issues. For example, Roberts *et al.* (2021) report that mental health-care services were able to swiftly shift from contact sessions to telehealth as an intervention of experiencing high levels of demand during the COVID-19 pandemic, whereas Khandelwal *et al.* (2022) report that the health-care services in Australia are devoted to delivering mental health-care services using video conferencing. In addition, Desai *et al.* (2020) in their study on how the COVID-19 crisis found that psychologists have provided the necessary mental health care in challenging times. The pandemic has transformed and increased telepsychiatry in medical health-care services (Celentano *et al.*, 2022). Other scholars have looked at telehealth in addressing societal issues such as drugs. For instance, Kleykamp *et al.* (2020) claim that the use of telehealth played a critical role in tackling substance use disorder treatment during the COVID-19 pandemic. Telehealth has been used to address most of the health-care services during the pandemic crises. So, telehealth affords society to receive health-care services support beyond the health-care facilities.

Khandelwal *et al.* (2022) in their study focusing on identifying business opportunities for entrepreneurs in the digital health-care environments found that using technology to support health care played an essential role in the growth of businesses providing telemedicine services remotely at a low cost during the pandemic. Health-care organizations are essential players in supporting telehealth. For example, creating an account for their health workers to have access to licenses so that they can effectively use some of the software required. Health-care organizations are therefore critical as they provide technology services in a form of the enablers such as platforms, software and policies (Camden and Silva, 2021).

Theoretical perspectives

To understand telehealth during COVID-19 emergency situation this study employed both the HBM and the UTAUT to interlink and highlight literature on how telehealth has played significant role during the COVID-19 pandemic.
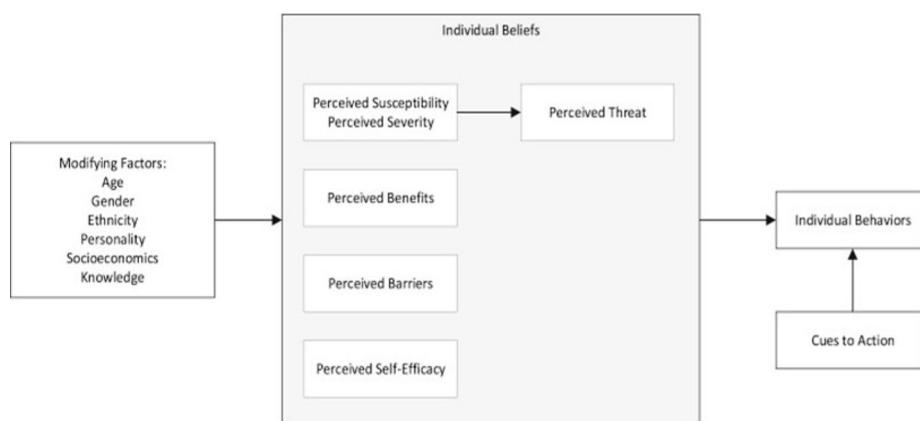
Health belief model

According to Gehlert and Ward (2019), the health belief model (HBM) is one of the most known public health models worldwide. It was incepted in the 1950s by social scientists in public health service to facilitate understanding of health behavior, specifically failure and success related to good health practices (Gurung, 2014; Gurung 2019). The HBM is also one of the most used public health frameworks that can be used to explain why people use and do not use health services despite being presented with an illness threatening personal or community health (Gehlert and Ward, 2019). Additionally, it has also been used for decades to study health crises such as vaccination, diabetes, tuberculosis, HIV/AIDS and other behaviors that require modification of a patient's actions to mitigate a threat to health (Sheppard and Thomas, 2021; Gehlert and Ward, 2019; Gurung, 2018; Pushpalata and Chandrika, 2017; Champion and Skinner, 2008). Notably, in the present year, Sheppard and Thomas (2021) used the HBM in COVID-19 related study, arguing that its application provides a detailed account of individual and environmental factors that precede utilization of health survives and other health seeking motivating behaviors (Sheppard and Thomas, 2021).

The basic premise of HBM is that people's health behavior is affected by their beliefs regarding the effectiveness, ease and consequences of doing or not doing a certain behavior (Gurung, 2018; Sheppard and Thomas, 2021). Mohammed *et al.* (2019) asserts that, people's engagement with the health-care systems is understood parallel to their respective socio-cultural, economic and demographic circumstances. Figure 1 by Sheppard and Thomas (2021) further provide a succinct illustration of the HBM. Concisely, the HBM illustration suggests that individual beliefs and direct cues to action inform behavior. In turn, beliefs are informed by one's background and are comprised of one's impression of the perceived threat, the perceived benefits to acting, the perceived barriers to acting and one's perceived ability to take action or self-efficacy. As such, individuals who fail to use health services and get health information have found to have lower health seeking behavior. However, individuals having higher health seeking behavior could better prevent disease and promote health.

Unified theory of acceptance and use of technology

Venkatesh *et al.* (2003) coined the unified model that integrated different views pertaining to the use and the acceptance of technology, namely, the unified theory of acceptance and use

Figure 1.
Health belief model
(Sheppard and
Thomas 2021)

of technology (UTAUT). The UTAUT model is based on the belief that technology users typically rely on their reasoning and what is common sense to them to determine their behaviours (Venkatesh *et al.*, 2003). However, the pandemic has changed the use and acceptance of technology in the health-care sector. It is well documented that UTAUT coined by Venkatesh *et al.* (2003) has managed to a greater extend assess the behavioural use and acceptance of technology. The advent of UTAUT was established as a result of extension from existing models that focuses on technology use and acceptance behaviour such as the technology acceptance model, innovation diffusion theory, motivation model among other models (Venkatesh *et al.*, 2003).

UTAUT model has been employed widely in literature and as a result, several studies have adopted the UTAUT across several fields that investigate the intention of adopting the use of technology. For example, Etemadi *et al.* (2020) point out that there is a necessity for UTAUT to be extended even though the UTAUT is an essential model with high explanatory influence. The extension of UTAUT in several fields affords the model to strengthen applicability of the model in various domains. Venkatesh and Davis (2000) explains that technology acceptance is predominantly about disclosing user's mindset regarding the use of introduced technological services or products and how the acceptance behavior is maintained.

For example, Zuiderwijk *et al.* (2015) point out that the UTAUT has a significant role to play given that it takes into consideration both technological and social factors.

The UTAUT consists of four determining components that focus largely on the use and intention behaviour of the users, and these are termed performance expectancy, effort expectancy, facilitating conditions and social influence. These are the factors that are considered to influence the user's intention to use and accept technology. Table 1 below draws the link on how the four UTAUT components are related to the undertaken review study.

Generally, there are several factors that contribute to the why people use and do not use health services. The internal factors link to the belief, intention and willingness of an individual to use or not use health services, whereas external factors may relate to socio-economic, financial support and accessibility. It is of great importance that people have access to enabling resources to health-care services to appreciate the benefits presented by using technology to access telehealth services. External factors may contribute to the individual's belief and willingness to using technology to access health-care services. Commonly, people accept the use of technology with the intention to attain a particular outcome. So, the use of technology and acceptance by society and who understand its potential outcomes may have vigorously increased for those with digital access. The advances in technology have compelled society to accept the use of technology to access several health-care services in digital format.

The current study

The intention of this article is to contribute to telehealth domain by interlinking both UTAUT and HBM theory to make sense of telehealth service utilization in the public sector during the COVID-19 pandemic. The lack of acceptance and use of technology in the public health sector is a complex issue and might be because of the lack of enabling resources, digital divide among intergenerational health-care workers and transformation. In contrast, there is a cohort of techno-savvy health-care workers that make use of various social technology services like messaging service applications for strengthening communication about work-related issues. Despite the increasing recognition of telehealth because of the available advances of technology in the health sector, minimal studies exist on how the

UTAUT components	Description	In relation to the review article on telehealth
Performance expectancy	Focuses on the user's behavior in terms of the belief that a technology system can be used to perform normal face-to-face contact duties to their expectations	The health-care practitioner making provision for telehealth and the patients having believe in the use of technology to access a particular service Typically, a user may be internal user (health-care practitioner) or external user (patient)
Effort expectancy	Converges the extent to which the technology is user friendly to the user	The telehealth service is user friendly to the potential patients who must use it
Facilitating conditions	Focuses on the infrastructure that may have an impact on the user's actual use of technology	Adequate skills, quality internet connection are key external factors for the users to effectively use telehealth, whereas the believe and the willingness of an individual are internal factors for the user to use technology for health-care purposes
Social influence	Focuses on the failure of an individual to make a personal judgement but places their judgement from the general feeling that other people have regarding the use of a particular technology	Patients and health-care practitioners who make a judgement is influenced by other people's perception on using technology for health-care services

COVID-19 emergency situation escalated telehealth, the latter of which remains a challenge in public health. To comprehend the identified nature of the problem this study, the purpose of this article is to understand how the COVID-19 emergency situation necessitated the behaviour influencing use and acceptance of telehealth in public health sector. The specific objectives of the study were to:

- explore and understand the literature on the intentions and behaviour influencing technology use and acceptance in the public health sector;
- employ and interlink both the HBM and the UTAUT to highlight the role of telehealth during the COVID-19 pandemic; and
- understand the challenges and opportunities resulting from the COVID-19 pandemic in the public sector.

Methodology
Several studies have employed several research approach and data collection methods in their studies on telehealth. For example, Bhatia (2021) in their study using personal interviews to explore the perception of health-care users towards telehealth services found that a considerable segment of the population is having high health-care need, and that there is positive attitude towards telehealth in India. Bilimoria et al. (2021) employed a comparative study to understand patient experiences with telehealth against in-person visits before and during the COVID-19 pandemic that surveyed, 200,987 carried out between November 1, 2019 and April 28, 2020. Malliaras et al. (2021) in their cross-sectional study that investigated the use and views towards telehealth among allied health clinicians in Australia treating people with musculoskeletal conditions during the pandemic. It is for that

reason that this study provides a review to draw on discussions of the data available from existing studies.

Search strategy

Comprehensive electronic searches were conducted using Emerald, Science Direct and Taylor and Francis databased to look for articles between 2019 and 2021 to identify relevant articles unsystematically. Full-text articles with original research reporting on the use of telehealth were included. The search was in twofold: firstly, the authors searched for "telehealth" from the two of the three databases; secondly, the authors searched for "telehealth during emergency situations" "telehealth in Africa" "telehealth in South Africa" in an effort to narrow the search and find literature from the South African context and African continent level as most of the published articles searched was from further afield. Two authors independently screened articles based on the inclusion criteria.

The topic and in some cases abstract of the article were read to scrutinize the relevance of the article to the undertaken study. This enabled the researchers to serve selected articles used from other articles found irrelevant.

Inclusion and exclusion

Search terms used included "telehealth" and later when we realized much of the data available was from further afield, we included search such as "telehealth in Africa" to recover existing literature from the African continent and South Africa, respectively.

All peer reviewed journals under the Emerald, Science Direct and Taylor and Francis databases. Most of the inclusion had to include "telehealth" in the title of the journal and published in recent years. After screening of the abstract, the decision was made as to if the article is relevant or not; if not, then the authors closed the online article, and if relevant, it was stored in a folder created to serve as a repository for relevant articles to read through it. Later, each article was read, a full text was undertaken and relevant data was extracted. Documenting process involved capturing general information such as citation of that particular article and specific information such as methods used, literature contributions and findings.

Relevance of articles

From the online search result primarily from the three databases (Emerald, Science Direct and Taylor and Francis), only 19 was considered for the results section of this review article. There are several reasons why other results articles were omitted. For example, other articles were found to be irrelevant to the study after a review of the abstract by the researchers as they either where not focused on telehealth, COVID-19 or done after the declaration of COVID-19 pandemic. The study also acknowledges that there were articles that were omitted simple because the authors had no access to the full articles. Therefore, only articles were the authors had access to were looked at the feasibility of being relevant to the study. The study used articles that were published in English and that were from peer-reviewed journals.

Results

Telehealth during COVID-19

Because the beginning of this pandemic telehealth use has increased in most parts of the world. For instance, Brotman and Kotloff (2021) point out that, telehealth services were reportedly not widely used prior to COVID-19 and often were restricted to rural areas or

locations with poor access to care in the United States. The pandemic has left people with broken heart because of being affected or infected by the COVID-19 at some stage in their life. For example, Torales *et al.* (2020) and Matli (2020) point out that the fear of contracting COVID-19 has led to society suffering from Insomnia, depression and other health anxiety. In addition, Miu *et al.* (2020) stresses the fear that patients may end up being vulnerable and exposed to other health issues because of staying home during the pandemic. Generally, the COVID-19 pandemic led to health-care service providers from both private and public to make rapid changes to how they provide services and the interaction with external parties, particularly, health-care users. Calton *et al.* (2020), opined that the COVID-19 pandemic has transformed the normal scenario of doing things in the health sector. The changes in the health sector have been affected from internal processes to how the health-care sector interact with external entities such as external health-care users. The little interaction with the outside world may trigger several disorders for some of the patients already with certain underlying mental health issues (Johnson and Rehfuss, 2020).

Smith *et al.* (2020) point out that outpatients with underlying health conditions are discomforted to visit hospitals for medical assessment and care. Similarly, Brotman and Kotloff (2021) asserted that telehealth was beneficial for health-care providers and outpatients before and during COVID-19 pandemic.

Telehealth services
In a nutshell, Telehealth refers to the use of advanced technologies available and accessible to provide support to remote health-care services. So, digital access and use is fundamental to effective telehealth services. For example, Bhatia (2021) in their study carried out in India found that the use of technology contributed to the use of telehealth services among their respondents. It is for that reason that most services in the health sector have taken advantage of the support provided by technology to provide the much-needed health-care services. The supertype entity, telehealth has a relationship with several health-care services that may be categorised as sub-entities or sub-grouping. For instance, Nepal *et al.* (2014) points out that the term telehealth is an umbrella that constitute of using technology to establish a connection and interaction to provide several health-care services. As such, several researchers have focuses specifically on certain aspects of health-care services such as telemedicine, telemental health (Nepal *et al.*, 2014; Sequeira, 2020), teletherapy (Malliaras *et al.*, 2021) and musculoskeletal conditions (Wood *et al.*, 2020).

Malliaras *et al.* (2021) stated that the use of teletherapy also enabled continued care of the patients. Apart from the benefit of being able to continue to provide services during the pandemic lockdown, telehealth is accepted by several societies. For example, Helleman *et al.* (2020a, 2020b) in their study on the use of telehealth in the ALS interviewed both patients and health-care professions and found that it is largely accepted and found to be suitable for both users. Similarly, Miu *et al.* (2020) adds that the COVID-19 pandemic has changed not just the health sector services but also the psychotherapy clinical operations. The pandemic has increased the use of telehealth because of lockdown with movement restrictions. For instance, Malliaras *et al.* (2021) in their study found that there was a substantial increase of telehealth from 0% use to over 60% use of teletherapy in treating patients with musculoskeletal conditions. Therefore, the pandemic has contributed to the acceptance and use of technology in providing health-care services. Telehealth has not only enabled the health-care profession to provide services but also it has improved how services are provided. For example, Sequeira (2020) reported that the pandemic affords the mental health care to find better ways to enhance their daily operations in line with the COVID-19 standards to ensure all stakeholders safety and health is protected.

Other studies have highlighted that there was no exceptional difference in using telehealth as compared to their traditional face-to-face contact servicing. For example, Malliaras *et al.* (2021) mentioned that the clinicians further reported equal efficacy of treating patients in person as of using telehealth resources. in the sane sentiments, Wood *et al.* (2020) embarked on study to outline the initial phases of rapid adolescent telehealth scale-up in response to the COVID-19 pandemic carried out at a single academic medical center and found that there were no significant differences in telehealth use by age, sex, gender or insurance. However, other studies argue that telehealth has not been given attention, even though communities have access to technology and internet connection. For instance, Hosseini and Yilmaz (2019) asserted that the use of telehealth by the health-care sector in Pennsylvania is relatively uncommon even though the over 90% of schools have quality internet connectivity in the area. This may suggest that there are factors that contribute to the society not accepting the use of technology for health-care services. In addition, having access to quality internet access means a little without adequate skills.

Benefits of telehealth
Telehealth is a beneficial resource that can support health to deliver their needed services to society. There are benefits associated with telehealth practice and this include convenience (Nobleza, 2019; Bokolo, 2021), extension of services (Sequeira *et al.*, 2020), geographical (Helleman *et al.*, 2020a, 2020b). Helleman *et al.* (2020a, 2020b) asserted that the telehealth enables patients to receive specialist treatment irrespective of geographical and the level of impairment. Nobleza (2019) in their study that sampled 67 medical and other health professional students found that Telehealth is a feasible option because of its convenient, timely and effective with little negative impact. Low cost. Hosseini and Yilmaz (2019) point out that telehealth is a key resource to reach and be distributed to a large audience at a low cost. However, others may argue that telehealth resources such as access and use of technology may create a divide regarding who can access telehealth in society because of high cost to internet connection. For example, as Howdle (2020) reported that the average price for 1 GB of mobile data costs an average of US$4.30 in South Africa of which is higher than countries like China (US$0.61), Russia (US$0.52) and India (US$0.09). So, in countries like South Africa with high cost to internet access, some of the telehealth services may not be a viable option.

The significant benefit of telehealth is the capacity to make provision for the extension of health services to many of their existing patients. For example, Sequeira *et al.* (2020) point out that the key benefit was the ability to expand our services to most of our currently established patients and dismantled the geographic barrier, whereas Doarn *et al.* (2014) opined that outpatients received service at the comfort of their home using technology such as conference call. The use of advance technologies enables homebased patients to connect and interact with health-care workers remotely. Hosseini and Yilmaz (2019) reported that people would be more attracted to receiving health related online services as compared to an actual physical visit at the health-care centre that is time consuming. The telehealth largely depends on how innovative the health-care practitioners find ways of capitalising of remote services such as using internet to extend communication and interaction with patients. Advances of technology has played a key role during COVID-19 pandemic not only to the health sector but also society to stay informed. Typically, for internal and external communication, access to COVID-19 information, information search and data recording. For example, Hosseini and Yilmaz (2019) reported that about 72% adults make use of the internet to search for health-related information.

Despite the challenges, Brotma and Kotloff (2020) found that telehealth to be positively received by patients seeking health services and beneficial to increasing access to services. Wood *et al.* (2020) shares the same sentiments with Brotma and Kotloff (2020) by stating overall their study demonstrated that rapid telehealth scale-up for adolescent medicine was achievable in response to the COVID-19 pandemic. Moreover, the results suggested that the rapid shift to telehealth generally resulted in favorable patient experience and possibly some improvement in racial disparities in access to health care (Bilimoria *et al.*, 2021).

Lessons: challenges experienced of using telehealth during the pandemic
There were challenges reported by health-care professions using telehealth during the pandemic. Brotman and Kotloff (2021) and Scharff *et al.* (2020) reported that there were numerous barriers that made the use of telehealth beyond the COVID19 public emergency unlikely. In general, the challenges experienced relates to internet connection (Malliaras *et al.*, 2021), privacy and distractions from patient homes (Malliaras *et al.*, 2021; Sequeira *et al.*, 2020). Access to use of internet connection has played a pivotal role in telehealth, however the lack of access to quality internet connection has served as an obstacle. For example, Malliaras *et al.* (2021) from their study identified eternal barriers such as internet connection and speed.

Generally, some individuals may experience distractions to effectively use telehealth as the issue of space to concentrate may be a challenge in the homeplace. For instance, findings from a study by Sequeira *et al.* (2020) revealed that some patients who are not motivated tend to have less interest in attending teletherapy, at the same time, some patients have struggled to keep up their focus because of distractions from their home. Patients were also perceived to have difficulties in finding appropriate spaces in their homes for private consultations and being effective in self-management (Malliaras *et al.*, 2021). Challenges of telehealth were also experienced by health-care professions. For example. Other clinicians also had psychological capability-based barriers such lack of confidence in using digital resources, feeling a lack of being hands on and the lack of the feel of a consultation, which was perceived as being impersonal (Malliaras *et al.*, 2021). Malliaras *et al.* (2021) further added that some of the clinicians found that the lack of in person consultations often made formulating a diagnosis and treatment a challenge. In the same sentiments highlighting that health-care profession challenges, Helleman *et al.* (2020a, 2020b) in their study reported that health-care professions stated lack of contact evaluation, comprehensive medical assessment and technical issues are some of the experienced barriers during telehealth.

The challenges experienced with telehealth during the COVID-19 pandemic also involved the current legislative. For example, the overnight changes in legislature resulted in difficulties for health-care sector to claim for reimbursement from medical aids. This was because billing and claims procedures had changed and differed with various companies, resulting in a cumbersome claims process for health-care providers and patients. Billing and claim submission for telehealth services is complicated; and has changed over the course of the pandemic; and varies with each insurance carrier, making telehealth adoption burdensome.

Generally, the COVID 19 pandemic have created a considerable several challenges to the health-care sector. One barrier identified indicated that telehealth was not ideal for new patients as it resulted in negative experience (Bilimoria *et al.*, 2021). As a result, Bhatia (2021) found that about 38% of the respondents who took part in their study were currently not

satisfied with the infrastructure and traveling distance. In this regard, telehealth is a solution a viable solution to ensuring patients receive convenient services.

Summary: the current state of knowledge from existing studies
Experiences, perceptions and behaviors

- *Access:* Access to quality internet connection means little without adequate digital skills and vis-visa.
- *Autonomy and adjustment:* Changes that came with COVID-19 were overnight and rapid, as such health-care workers held the perspective that they had to adjust immediately and had no autonomy in deciding on whether to use or not use telehealth tools.
- *Improved access:* The use of telehealth has extended access to those previously disadvantaged, consequently bridging the inequality gap.
- *Use and acceptance:* The use and acceptance of telehealth is often dependent on the patient attitude. Patients who have negative attitude towards benefiting from virtual consultations are likely to not use telehealth services.

External barriers

- *Availability of resources:* A lack of resources exists in low socioeconomic status contexts resulting in no technology devices, varying internet connection speeds and limited privacy in households.
- *Competence:* Health-care workers expressed incompetence because of the lack of training needs and support with the implementations of tele health services, particularly the expansive novice uses of technology devices.
- *Legislature regulations and rapid expansion:* The rapid changes also necessitated overnight legislature amendments to enable the regulation of rapidly expanding use of telehealth services. Health-care workers reported that some legislatures resulted in burdensome claims processes from medical insurance companies.

Psychological barriers

- *Self-efficacy and confidence:* Health-care workers had poor self-efficacy and self-confidence in using technology because of the lack of training.
- *Impersonal consultations:* Telehealth inhibited in person human interaction, which was perceived as impersonal and not ideal for new patient consultations.
- *Poor self-management:* Health-care workers had concerns about the patients' poor self-management as they had to be self-dependent in carrying recommended treatment given by their health-care providers.

Use beyond the COVID-19 pandemic

- Reviewed studies conceded that the barriers highlighted in using and accepting telehealth outweighed the benefits. Moreover, there are limited efforts by governments in supporting to telehealth, which has negative impact on sustainability and long-term use beyond the pandemic.

Key findings
Figure 2 below is used to for mapping the two used theories for this review article.

UTAUT accentuates on the intention to use and accept technology, whereas HBM emphasis that people's health behavior is affected by their beliefs. Therefore, to a greater extend, the study found that both the UTAUT and HBM share several prominent common attributes (behavior, perceptions, intention, belief, acceptance and consideration of individuals backgrounds). The individual's behavior influencing the use and acceptance of technology for health-care purpose. Individuals' health behavior is often influenced by their and perception belief. The acceptance of using telehealth requires one to have positive intentions and background of the expected outcomes.

Typically, the COVID-19 pandemic lockdown provided the health sector with an opportunity to maximize the use of telecommunications and other advanced technology services to provide support existing health-care services. However, the believe and intention of using telehealth may be hindered by certain internal and external factors. Telehealth is likely to be viable for patients and health-care service providers with resources such as financial support, skills, access to enabling resources and infrastructure. Most of the people who make use of public health-care services cannot afford the private health care. Public health care is subsidized by government to ensure people have access to basic health-care services for free. Most of the individuals that make use of the public health care have little or no access to advanced technologies or internet connection to support telehealth.
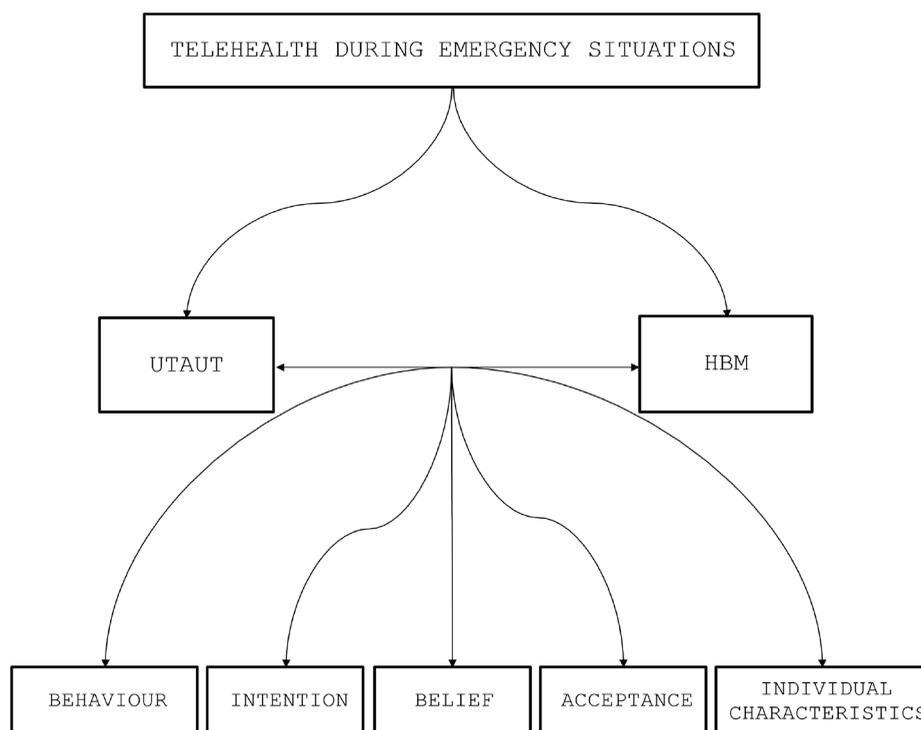
Figure 2.
Mapping the theoretical perspective to telehealth

Conclusions and recommendations

This review article explored how the COVID-19 emergency situation necessitated the behavior influencing use and acceptance of telehealth in public health sector. Many outpatients were forced to stay from their homes and this has altered the usual health-care contact-services environment than that experienced prior to the COVID-19 lockdown. Literature review highlights that telehealth has experienced unparallel experiences because of the restrictions of the pandemic. Even though the COVID-19 pandemic has led to an increase in the numbers of health-care services supported by technology to enable effective remote services, technical challenges were experienced. Barriers found included, overnight changes in legislature which resulted in difficulties when claiming for reimbursement from medical aids. This was because billing and claims procedures had changed and differed with various companies, resulting in a cumbersome claims process for health-care providers and patients. Billing and claim submission for telehealth services is complicated; has changed over the course of the pandemic and varies with each insurance carrier, making telehealth adoption burdensome.

Health-care workers and outpatients who were techno savvy, with access to resources and had accepted the use of technology were more likely to have interest in exploring telehealth services. Moreover, some health-care workers believed that they had inadequate training and support and competence to use telehealth resource, which discouraged use beyond the pandemic. It was, however, substantial that COVID-19 necessitated the rapid use of teletherapy, considering that there was 0% use prior to the COVID-19 pandemic. Overall studies showed that in the early periods of COVID-19 patients used telehealth. However, because of the barriers identified outweighing the benefits of teletherapy, the use of teletherapy beyond the pandemic was found be limited.

The limitations of this present study were the use of secondary data. Moreover, this present study does not intend to generalize its findings to the general population. The study used the variables and concepts from both HBM and UTAUT theory. So, there was no intention to expand the models or discover the new relationships between variables under the COVID-19 pandemic. So, other future studies need furtherly strengthen the contributions. The study makes the following recommendations for future research to conduct an original research article that presents new experimental results diverse communities considering digital skills and access to internet infrastructure. Furthermore, it is recommended that researchers may extend several other theories in the subject of telehealth. More studies can also focus on the implementation and evaluation research to grow and sustain telehealth efforts safely and equitably, specifically, across communities of low socioeconomic status.

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