

Virtual Care

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Virtual care extends beyond the walls of healthcare organizations to provide care at a distance. Virtual care encompasses the provision of care using advanced video conferencing technology to support remote care that takes place between patients and providers and the use of virtual reality technology to simulate care environments. Some of virtual care's use in healthcare includes application to pain and anxiety management, virtual consultations and follow-up visits, rehabilitation and therapy services, outpatient clinics, and emergency services.

Keywords: virtual care ; virtual clinics ; healthcare ; virtual reality

1. Introduction

Self-management of health is an essential part of everyday life. Historically, provider-centric models have been used by healthcare organizations (e.g., hospitals). In provider-centric models, patients seek care by visiting a provider's office or making trips to healthcare facilities. For example, a patient wishing to receive diabetes education for insulin management would need to visit a diabetes education clinic with data from their glucometers to show a registered nurse (RN), dietician, or physician so that they are able to receive the necessary support from their providers. With technological advances in healthcare, there is an opportunity to enhance existing patient-provider relationships by creating new tools to support a patient-centric model of care. This patient-centric model of care occurs when providers and healthcare organizations are trying to provide better access to care from a patient's perspective, which can include offering services such as telehealth visits. Virtual care provides the opportunity for the description above to become a reality, as virtual care is able to increase the level of convenience for patients to access care from their providers.

Many technologies exist in the global communications market to support virtual connections through real-time asynchronous communication, such as Skype® or FaceTime®. These technologies connect family and friends regardless of geographic location and/or time differences. When it comes to healthcare, there are privacy concerns in using these common tools in terms of Personal Identifiable Information (PII) and Protected Health Information (PHI). PII refers to information that recognizes individuals based on unique identifiers, such as a name, social insurance number, and/or driver's license ^[1]. A person's PHI refers to information generated from medical records, such as name, medical record numbers, or biometric identifiers, but it may also contain many of the identifiers in PII, such as name, driver's license number, or passport number ^[1]. With this in mind, companies from all around the globe have developed tools specifically for use in healthcare. These tools allow for compliance with local privacy regulations; for example, companies in the U.S. comply with the Health Insurance Portability and Accountability Act (HIPAA) ^[2]. In Canada, virtual tools comply with the Freedom of Information and Protection of Privacy Act (FIPPA) according to the Office of the Information and Privacy Commissioner and the Personal Information Protection and Electronic Documents Act (PIPEDA) ^[3]. Hence, around the globe, countries have different regulations that vendors must comply with in order to produce technologies that are acceptable by the privacy and security standards of these various countries. These acts serve the purpose of protecting an individual's private information from wrongful use or distribution into the black hole of our information-heavy world.

2. Current Insights

It can be seen that virtual care refers to the use of video technology to connect patients and healthcare providers together regardless of where each party is located. The use of this technology has also influenced a variety of clinical settings, such as pain management, mental health, rehabilitation and therapy services, outpatient clinics, and emergency services. With mostly positive perceptions of the technology, virtual reality technology has also become a part of virtual care by augmenting the virtual care experience. "VR technology has become increasingly affordable, flexible and portable, enabling its use for therapeutic purposes in both inpatient and outpatient environments" ^[4]. The expansion of tools and technology that support virtual care have complemented the traditional "bricks and mortar" medical practice while at the same time improving healthcare education. Remote training of health professionals using online modules or simulations of

virtual patients have been well received by students, with the majority of health professionals expressing interest in using a similar mode of training in the future or applying virtual care to their practice. As Shumaker et al. [5] state, "It is known that the creation of a web-based educational system consists not only in the digitization of texts or printed materials, but in providing its own language, principles, tools and methods, which makes the virtual learning environment (VLE) a space dynamic and interactive, current, closer to the reality of the user and extremely rich, as it allows the use of different media resources that make the teaching-learning process more creative, interesting and powerful." Lastly, consumer perspectives on virtual care from both patients and providers have been positive as well, especially among patients. It is undeniable that convenience and efficiency play a great factor in patients' choice for virtual care. However, the technology can still be a barrier to receiving care for some groups such as the elderly.

To list a few of the efficiencies of virtual care compared to traditional visits, wait time is often decreased, and the need to travel to an onsite location for care is removed, hence also decreasing or eliminating transportation costs. As previously mentioned in the study by Gordon et al. [6], the costs associated with patients visiting in-person health clinics, urgent care centers, emergency departments, and primary care physician visits were estimated to be \$36, \$153, \$1735, and \$162 higher in non-virtual visits than virtual visits, respectively. Aside from cost and wait times, the satisfaction level in patients who have received care virtually did not decrease compared to traditional visits. In fact, depending on the type of visit required, patients often expressed interest to include virtual visits in their future care plan. Other efficiencies and benefits that do not directly relate to care can be the environmental impact.

As many are familiar with the 2020 global pandemic caused by coronavirus, this has led to some dramatic changes in the way people live and work [7][8]. Governments all around the world have mandated the closure of non-essential services, such as restaurants and entertainment venues, while essential services, such as clinical programs, pharmacies, public transportation, and grocery stores continue to remain open during the pandemic. Given the risks of the pandemic, many countries also began the practice of social distancing, hence reducing the need to visit a care facility, and having virtual visits where possible became the public's preference [7][8]. With an increase in virtual visits, the need to travel decreased; therefore, this is a perk in terms of environmental impacts and decreasing the carbon footprint on this planet [9]. Progressively, virtual care can become the norm for many patients and providers, and it may be hard for some to revert back to traditional practice. If it was not for COVID-19, virtual care uptake and expansion may not have occurred at such speeds.

In terms of the implications of virtual care on health informatics practice, we can expect there to be many collaborations between health informatics professionals and healthcare organizations in joint research projects on the implementation of virtual care [7][8]. This can include being a consultant for healthcare organizations as they implement a new virtual care technology or conducting evaluations of the post-implementation of virtual care technologies. If evaluations produce positive outcomes (e.g., [7][8][9][10]), the government may also devote more funding toward future virtual care research or wide-scale implementations. This will also affect the training and education for health informatics programs.

Health informatics is a relatively new program in many universities, and some do not even offer this program. Most students benefit from this program if they have career interests to work in the healthcare sector as an informatics professional. It is common for graduates of the program to become a liaison between technology and medical professionals, as they implement technological solutions required by clinical workflows [11]. Given that virtual care will potentially transform the way care has been delivered, it would be worthwhile to incorporate courses as part of the curriculum that cover the successes and failures of virtual care implementations. As an example, the Health Information Science program at the University of Victoria is planning to add an elective course on virtual care to trial the popularity of this topic prior to further embedding this as part of their mandatory course structure. Contents of the course can entail the implementation process of a virtual care tool, with real-life examples or guest speakers who have the knowledge and experience of virtual care implementations [8]. Future learning experiences in work settings terms can also include opportunities to work on virtual care projects [8], which can ultimately open up new employment opportunities for students.

3. Conclusions

By connecting patients and providers remotely, virtual care has made its presence in different aspects of healthcare, including healthcare education, as well as positive impressions from end consumers. As technology advances, virtual care becomes more accessible, and utilization will increase; hence, acceptance of virtual care and the technology that supports it can also increase in parallel. The technology supporting virtual care, such as video conferencing tools and virtual reality, will also mature to enhance patient and provider experience in using those tools.

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