VIDEO CONFERENCING-DELIVERED HEALTH INTERVENTION

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Abstract

Videoconferencing has emerged as a form of telemedicine for delivering health interventions since the turn of the millennium. It has many advantages over other forms of telemedicine like phone calls or web-based system because of its multisensory outputs. For instance, healthcare providers and care recipients can see each other, listen and interact with each other in real time. It makes the experiences of the remote physical or psychological therapy sessions, group health education, and medical consultation more satisfying. The COVID-19 pandemic has accelerated the wide adoption of it, and there has been an upsurge of articles investigating the feasibility of videoconferencing as a form of healthcare delivery model. This chapter begins with a brief historical review of telemedicine and telehealth. Thereafter, the current evidence for the effectiveness, uniqueness, and challenges of videoconferencing-delivered health interventions is reviewed. Finally, the use of videoconferencing as an extension of space and place by traditional health institutions is discussed.

Keywords: videoconferencing, telehealth, tele-exercise, telerehabilitation, telepsychiatry, tele-palliative care

INTRODUCTION

The use of videoconferencing (VC) has emerged as a form of telemedicine for delivering health interventions since the turn of the millennium. Initially, VC was mainly used to provide remote healthcare to patients who lived in rural areas and had limited access to healthcare services. Before the outbreak of the coronavirus disease 2019 (COVID-19) pandemic, VC was widely used by various healthcare professionals in different disciplines. Since the pandemic, many research studies have documented the feasibility of VC-delivered health (VCH) interventions in different population sub-groups and among different healthcare professionals. These studies have found that the effectiveness of VCH interventions is similar to the effectiveness of face-

to-face (F2F) health interventions for most participants (Amorese & Ryan, 2022; Berryhill et al., 2019; Steel et al., 2011). Unlike telephone-delivered or web-based systems for delivering remote healthcare, VCH interventions have unique advantages over F2F health interventions. The multisensory outputs of VC make it a more optimal communication medium than other information and communication technologies (ICTs), i.e. telephone, email, and web-based systems, which have a narrower range of sensory modalities. An increasing number of studies have shown that VCH interventions have the potential to permanently change the healthcare landscape, and instead of being a supplement or substitute for traditional F2F health interventions (Amorese & Ryan, 2022; Berryhill et al., 2019; Mallow et al., 2016; Steindal et al., 2020; Wundersitz et al., 2020). They may become an integral part of healthcare service delivery, and an extension of health services to patients' homes without the limits of physical place and space.

A BRIEF HISTORY OF TELEMEDICINE

VCH is a type of telemedicine, which is a term coined in the 1970s. Telemedicine has been broadly defined as the use of various types of ICTs to improve access to care and medical information with the aim of improving patient outcomes (World Health Organization, 2010). Initially, the use of ICTs in telemedicine referred to the use of videotapes and televisions to facilitate education and consultation between medical specialists and regional general practitioners in mental health disciplines (Benschoter et al., 1965). As ICTs have evolved, telemedicine now refers to the use of telephone calls or email messages for medical consultations. In recent time, telemedicine has included the use of VC technologies to improve access of healthcare for patients in rural and remote areas (Department of Health and Human Services, 2015). In general, ICTs may be divided into three main categories, namely, synchronous, asynchronous, and hybrid. In the synchronous mode, real-time communication occurs for both parties. Examples of this type are VC and telephone calls. The asynchronous mode refers to 'store-and-forward' communications, which include mobile applications, email messages, online discussion forums, and web-based systems. The hybrid mode simply refers to the combination of both synchronous and asynchronous modes of communication (Rudel et al., 2011).

The terms 'telemedicine' and 'telehealth' are used interchangeably in the literature. While both terms emphasise the use of ICTs to provide remote support, 'telehealth' usually refers to broader health-related service delivery by healthcare professionals, such as allied health professionals (Rudel et al., 2011), while 'telemedicine' usually refers to clinical service delivery by physicians only (World Health Organization, 2010). In addition to the terms 'telemedicine' and 'telehealth', when describing the use of ICTs for remote care in different disciplines such as psychiatry, mental health, palliative care, rehabilitation, and exercise intervention, terms like 'telepsychiatry', 'telemental health', 'telepalliative care', telerehabilitation', and 'tele-exercise' are found in the literature.

Emergence of VC-delivered health interventions

As described in the previous section, when VC is used as the mode of delivery of a health intervention, it falls into the synchronous communication telehealth category and supports real-time communication between health service providers and patients or clients. It also allows two or more locations to be connected in real-time using two-way video and audio transmission (Rudel et al., 2011). The application of VC in delivering health interventions may be traced

back to the 2000s in different healthcare disciplines. Studies of VC-delivered interventions for long-term chronic disease management (Banbury et al., 2018; Foucher et al., 2015), exercise intervention delivery (Wu & Keyes, 2006), long-term weight management (Ahrendt et al., 2014), and psychotherapy (Shore, 2013; Strachan et al., 2012) have been reported. These studies have explored the use of VC as a delivery mode because of its unique advantages of reaching individuals in rural areas and the lower cost of long-term management. A review revealed that patients with a wide variety of contexts and conditions (e.g., cancer, diabetes, chronic obstructive pulmonary disease, osteoporosis, and cardiovascular disease) have high levels of satisfaction with VCH interventions (Steel et al., 2011). The use of VCH interventions is especially well-adopted in the field of nursing. For instance, nurse-led clinics or interventions using VC have provided comprehensive and high-quality care for cancer patients (Kwok et al., 2022a; Reb et al., 2020), sexual assault victims (Miyamoto et al., 2021), older adults (Wong et al., 2022), and patients with prevalent chronic diseases (Whitmore et al., 2020).

The feasibility of VC as a delivery mode has been investigated, and there is both quantitative and qualitative evidence showing favourable results. There is an accumulating evidence demonstrating that patients have high levels of satisfaction with and acceptance of VCH interventions (Richardson et al., 2009). VCH interventions have become widely accepted and adopted in health disciplines that rely heavily on verbal communication or advice, such as psychotherapy, speech therapy, or dietitian-led dietary advise sessions. Conversely, it is less accepted or adopted in physical health disciplines that require a more hands-on approach (Wundersitz et al., 2020).

COVID-19 as a turning point for the widespread adoption of VC as a delivery mode

There had been a significant turning point in the adoption of VC during the COVID-19 pandemic, which required healthcare services to transition to remote care as a precautious measure. Telehealth became the only practical and feasible means to maintain professional connection and healthcare delivery during lock-down periods or when strict social distancing measures were in place. Since the onset of the pandemic, there have been numerous studies reporting the use of VC as an alternative for the conventional F2F healthcare services. Examples included interventional studies for individuals with mild intellectual disabilities (Oudshoorn et al., 2021), older adults (Wong et al., 2022), individuals with dementia (Greenwood-Hickman et al., 2021), youth with mental health problems (DeLuca et al., 2020), cancer patients and their caregivers (Snyder et al., 2021), adults with psychological distress (Keyan et al., 2021), individuals with Parkinson's disease (Kwok et al., 2022b), children with autism spectrum disorder (Su et al., 2021), and individuals with obesity (Calcaterra et al., 2021). Findings from these studies have demonstrated the successful transformation to the online delivery mode for most participants. The VC mode has also been positively received by most interventionists and participants.

EFFECTIVENESS OF VC-DELIVERED HEALTH INTERVENTIONS

Health outcomes

Several review articles have shown that VCH interventions produce similar or equivalent effectiveness as F2F-delivered health interventions in health outcomes (Amorese & Ryan, 2022; Berryhill et al., 2019; Steel et al., 2011). For instance, patients with Parkinson's disease who received VCH had a similar improvement in VO_2 compared to patients who received a F2F

intervention (van der Kolk et al., 2018). In the field of psychology, F2F- and VC-delivered cognitive-behavioural therapy (CBT) were found to be equally effective in reducing depressive symptoms in children. In postnatal care, VCH and F2F-delivered interventions have been shown to be equally effective, with both delivery modes resulting in a similar breast-feeding prevalence (Seguranyes et al., 2014). Research on counselling interventions for substance abusers has also shown that patients in the groups receiving a VC- or F2F-delivered intervention demonstrated a similar positive result for abstinence and with a 100% attendance when returning to less-intensive care (King et al., 2009).

Engagement

Participants' level of engagement in VCH interventions has been found to be similar to that in F2F interventions. Children with special education needs and individuals with an intellectual disability have been shown to be equally engaged in activities requiring fine and gross-motor skills during VCH and F2F interventions (Oudshoorn et al., 2021; Wynn et al., 2012). The effectiveness of VCH interventions in engaging participants is also reflected in attendance rates. For example, a VC-delivered CBT intervention for children and a VC-delivered yoga intervention for individuals with Parkinson's disease have been shown to have high attendance rates (Kwok et al., 2022b).

Empathy

While the effects and engagement ability of an intervention are essential, the establishment of a relationship between the interventionist and the participants is also important. Research has shown that VCH interventions are able to effectively convey warmth and empathy. In the field of psychiatry, while clinicians have expressed concern about the difficulty in establishing rapport and trust and showing empathy towards their clients (Wynn et al., 2012). Interestingly, clients of VC-delivered psychotherapy sessions perceive therapists to be significantly more empathic and supportive during VCH interventions than F2F interventions (Sperandeo et al., 2021). A similar phenomenon was observed in VC-delivered stroke rehabilitation. It has been suggested that conveying empathy does not necessarily require physical touch or environmental proximity, because it may also be communicated through facial expression, vocal intonation, and attentive participation in an online mode (Cheshire et al., 2021).

ADVANTAGES OF VC-DELIVERED HEALTH INTERVENTIONS

VCH interventions are able to remove the barriers of distance and mobility, create unique safe spaces for patients, and cost-effectively maintain long-term management and the continuity of care.

Removing the barriers of distance and mobility

It has been found that a VC-delivered exercise intervention reduces the barriers related to transportation and improves access to trained healthcare professionals for those who have geographical or mobility restrictions (Amorese & Ryan, 2022; Mois et al., 2019; Wakasa et al., 2020). Moreover, for patients with a high symptom burden, VCH interventions represent an excellent method to maintain the continuity of care by healthcare providers (Chávarri-Guerra et al., 2021).

Creating a safe place and space

In the field of psychiatry, users of VC-delivered services have reported that VC-delivered care provides feelings of safety and security. They have found that the VC delivery mode reduces stigma, as care is provided in the home environment and, therefore, is more confidential and safer (Shore, 2015). Similarly, research has shown that substance abusers prefer VC-delivered counselling with mental health professionals to the F2F mode because of the increase in confidentiality (Berryhill et al., 2019). Similarly, patients receiving palliative care have reported that VC-delivered care contributes to feelings of relief, tranquillity, and security. They have also reported experiencing concentrated responsiveness from healthcare professionals and a high possibility of reaching agreement on the division of responsibilities for future health actions (Steindal et al., 2020).

Maintaining long-term management and continuity of care

VCH interventions also have greater long-term effects on weight management than F2F interventions (Ahrendt et al., 2014). Reb and colleagues (2020) found that the skills practiced during a nurse-led VCH intervention helped to ease anxiety and fears related to cancer progression in patients with advanced cancer. The severity of most symptoms, such as depression, anxiety, emotional stress, and pain severity, have been shown to decrease for cancer patients after receiving a VCH intervention (Kwok et al., 2022; Ream et al., 2020). Most importantly, enhanced quality of life and improved self-efficacy have also been reported after VCH interventions (Chen et al., 2018; Wong et al., 2022).

CHALLENGES OF VC-DELIVERED HEALTH INTERVENTIONS

Although VC-delivered health interventions are shown to be as effective as F2F health intervention on certain health outcomes and has its own uniqueness, health interventions delivered by VC do face some challenges. They are privacy concerns, receptiveness of service providers and technical challenges.

Privacy issues

As previously mentioned, some patients perceive VCH to have high confidentiality, as it is delivered at the patients' homes, where the home environment enhanced the feeling of privacy. However, some patients are worried that the remote sessions are not totally private or the sessions may be privately recorded and viewed by others (Rodda et al., 2022; Wynn et al., 2012).

Receptiveness of the health service providers

Health practitioners, in general, are less receptive to VC than patients (Steel et al., 2011). There are two major reasons that affected their receptiveness. Firstly, in the field of psychiatry, psychiatric health practitioners perceive increased efforts in using VC in delivering therapy session. . They perceive using higher amount of effort and energy in building rapport and demonstrating empathy to service recipients when compared to in-person sessions (Wynn, Bergvik, Pettersen, & Fossum, 2012). Secondly, perceived quality of VCH is lower. For example, in the field of integrative care, VCH that requires supervising patients' bodily movements, like VC-delivered exercise sessions, even participants used external webcams and adjustable stands, health practitioners have difficulty in viewing the participants' entire bodies, thus hindering their ability to give quality supervision or instructional adjustment to the participants (Snyder et al., 2021).

Technical challenges

To deliver VCH, ICTs infrastructure is required. Not all health service providers have access to internet or stable internet connections. Additionally, health service providers might not have appropriate hardware or professionals with adequate knowledge to operate hardware requires for VCH. Similarly, service users may not have internet access, and device to connect to VCH (Chávarri-Guerra et al., 2021).

A PERSPECTIVE FUTURE ROLE OF VCH INTERVENTIONS IN THE SMART HEALTH ERA - EXTENDING THE SPACE AND PLACE FOR HEALTH INTERVENTIONS

VCH interventions have the potential to extend the space of intervention from the clinic or hospital to the patient's home. COVID-19 has accelerated the adoption of VC in delivering health interventions and appeared to have 'permanently' changed the healthcare landscape. It has also encouraged the wider adoption of VC from lecture-based health education interventions to programmes involving exercise and physical health rehabilitation. Studies conducted during COVID-19 have provided evidence that interventions not originally planned to be delivered by VC can be successfully adjusted to be delivered by VC and achieve good adherence and engagement from participants.

It is worthwhile to highlight some potential health improvements and benefits for individuals arising from the use of VCH. VCH allows long-term lifestyle and disease management that improve a person's health in a long run. Long-term lifestyle management programmes for specific health purposes were not adequately provided to patients from health institution in the past because of the physical space limitations. The use of VC allows continuing health intervention and does not require the use of extra space from health institution. Physical fitness of a patients can be improved with the use of VCH. Research has suggested that patients are more motivated when they attend supervised VC-delivered exercise intervention in their home environment and there is a high potential in making exercise a habit (Wakasa et al., 2020). Long periods of physical rehabilitation or psychological therapy follow-up with patients will no longer take up physical space in the clinic or hospital, but can be performed in the patients' living environment. From a social health perspective, VC has the potential to help reduce the feelings of loneliness in older adults and to connect older adults in geriatric institutions with their loved ones (Naudé et al., 2021). Although individuals' technical literacy, internet access, and device ownership are challenges to the widespread adoption of VCH interventions, the benefits of VC identified above make it worthwhile to direct multilevel and multidisciplinary efforts towards addressing these challenges.

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