



Virtual Reality in Mental health – Opportunities and Challenges

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Abstract

The idea of virtual reality has been generally exploited in the domain of the health sector and effectively planned in various areas like medical training, awareness, counseling, etc. It basically employs a web-based platform to create a virtual working environment. Virtual reality has been discovered as a topical intervention of the digital field. It is rapidly changing the traditional way of medical learning methodologies and case handling approaches. Moreover, It has been successfully implemented in mental health settings mainly due to its customizability feature.

Introduction

Virtual reality and its use within medical science have seen exponential growth in the last few decades (Papadopoulou, Chui et al. 2019). The graph has been one of refinement owing to advancements in technology. Ivan Sutherland in 1965 for the first time, mentioned the idea “make that (virtual) world in the window look real, sound real, feel real, and respond realistically to the viewer’s actions” (Sutherland 1965). Fifty-five years later, we have a robust Virtual Reality technology that assists mankind in all the sphere of life. The progress along the last 55 years has seen technology and devices developing, adapting and evolving. Mandal (2013) in their study highlights some of the milestones along the way : Sensorama 1957, The Ultimate Display , “The Sword of Damocles” , VIDEOPLACE, VCASS , VIVED – Virtual Visual Environment , VPL – The VPL company manufactures the popular DataGlove (1985) and the Eyephone HMD (1988) – the first commercially available VR devices, BOOM, UNC Walkthrough project, Virtual Wind Tunnel, CAVE. The initial success of VR was seen in the aviation industry (Chittaro, Corbett et al. 2018), including space research. Initially, the health care adoption of VR focused on training and research, however, availability of Head-mounted devices, gesture-sensing gloves, synthesised sounds, and vibrotactile platforms have introduced VR into other areas of health care such as psychological therapies (Valmaggia, Latif et al. 2016).

Virtual reality in mental health

Opportunities

1. VR enables the individual to experience a near-real world in a controlled environment which is key in mental health therapies. Use of VR in mental health can be broadly classified into three areas – therapy, rehabilitation and recreation. Among these areas, VR is used predominantly in the delivery of therapies. Beidel, Frueh et al. (2019) noted VR as very commonly used adjuvant in Post-traumatic stress disorder (PTSD). This has been successful among the veterans in America (Rothbaum, Hodges et al. 1999). More over, Maples-Keller, Bunnell et al. (2017) in their study, noted Anxiety disorders, in general, as one of the areas within mental health that have reaped benefit from Virtual reality. The main treatment goal of all anxiety disorders is graded exposure to the anxiety-provoking trigger called exposure therapy (Miloff, Lindner et al. 2019). This trigger can be the height (agoraphobia), cats, dogs, spiders, and flying. Traditional exposure therapies rely on patients' ability to imagine the trigger situations and learn to manage anxiety, which varies among patients. However, with VR, the patients can experience a near real-world experience

The virtual reality lab at the NIHR/Wellcome Trust is running a trial VR therapy session for patients diagnosed with schizophrenia (Freeman, Yu et al. 2019). The project is named “gameChange”. 400 NHS patients across England will take part in the project. The project aims to help tackle the patient's fears associated with schizophrenia such as fear of speaking to others, getting on a bus, doing shopping, etc. The project is a co-production endeavor which in itself is a clinically robust evidence-based approach whereby the therapy is designed and created using input from patients who have lived experience of schizophrenia.

According to West, Knight et al. (2018), a key feature of the is therapy trial is the automated design, a step by step program that enables people to practice their own pace. It is graded too in complexity and approach. The whole program is delivered in 6 sessions of thirty minutes. Each sessions is supported by a virtual coach who provides information to overcome anxiety. This is reflective of a real-life therapist who uses a calm guiding approach in anxiety management. One of the challenges in a real-life therapy session is the voluntary participation of the patient. VR approach is hugely successful in ensuring voluntary participation as they know that simulations are not real. There are six settings identified in this pilot project and is in line with evidence-based practice.

One of the areas that need improvement within this project is the graphic details of the virtual space. A more realistic setting would enhance the virtual experience and improve patient outcomes. In addition, ethical issues and patient confidentiality limits the use of professional input into scene creations, however, if the pilot project is to be rolled out in the future, the team should consider improving the visual realisation of the scenes.

2. An innovative VR approach has been timely used at Israel’s Sheba medical center (prnewswire.com, 2020). VR is being used to provide telehealth services for patients quarantined with Coronavirus. The service is provided by XRHealth and aims to treat patients while inpatient and monitor them when discharged. Telemedicine within a VR space will be the primary means of interacting with and treating the patients. Even though there is not a great detail of how the service is provided, XRHealth is focusing on delivering VR experiences to reduce isolation and boredom in isolated patients. Moreover, they have treatment platforms built within the VR space to alleviate stress and anxiety which are associated with coronavirus infection. Sheba medical centre aims to tackle post-traumatic stress disorder is usually associated with long term hospital isolations (Sprang and Silman 2013).

3. Severe mental illness benefits from systemic therapies. Traditional therapies are now coupled with digital technology. Such changes enhance treatment efficacy for a range of mental illness. Cognitive behaviour therapy (CBT) is one such area that has embraced VR technology for treatment delivery. Using VR technology enables the therapist to acquire real time cognitive, emotional, physiological and behavioural responses to triggers and stimulus. It further enables the therapist to tailor the treatment objective to individual needs. Moreover, studies have found VR technologies to be effective in treating psychosis, cognitive rehabilitation and learning social skills

Challenges:

The author intended to explore the challenges the VR posed in a mental health setting. However, in the light of the topical Covid 19, The author decided to explore the measures the VR providers within mental health settings can take to mitigate the Covid 19 spread. HMD causes sweat and heat to accumulate while in use; moreover, an infected person can leave the virus on the handset for up to 9 days. The following measures are helpful in mitigating virus transmission (aixr.org, 2020).

1. Hand washing: Twenty second hand washing should be the mainstay in any gathering irrespective of the size of the group. If it is not possible, hand sanitising should be done with an alcohol-based sanitiser (Suganthan 2019).
2. Alcohol-based wipes:60% isopropyl alcohol: can be used to clean headsets before and after wearing.
3. Disposable VR masks
4. Silicone wipe able face plates: The porous foam material on the inside of HMD's allows body fluids to seeps in and eventually, it makes the cleaning aspect challenging.
5. Silicone control covers: Make sure to wipe down controllers while cleaning the headsets
6. Concentrated UVC light cleaning: Medical grade UV lights acts as an adjuvant in keeping the devices clean

Other challenges include,

- Cost implications: HMD and virtual reality interfaces are expensive and are still being developed. It is hoped the technology will eventually be affordable in future.
- The need for appropriate internet bandwidth may result in the technology less available in certain parts of the world.
- Need for high specification computer systems makes this technology less affordable for most people.

Conclusion:

Virtual reality as a medium of service delivery has evolved tremendously over the last decade. It has been successfully used in mental health settings mainly due to its customizability feature. However, the industry is yet to refine the hardware so that it is more user-friendly. Content creation is an area that needs a lot of input, especially within mental health. While both the areas are being refined and developed, the practical day to day challenges still exists such as hygiene practices around HMD's in light of COVID 19. The ever-growing evidence-based knowledgebase provides measures that are sufficient to overcome these challenges.

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