

# How can Virtual Reality be used to Aid Mental Wellness

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## ABSTRACT

Numerous articles already roam the surface of the World wide web regarding how Virtual Reality (henceforth, VR) can be used to treat various mental health disorders including anxiety, PTSD etc. This research paper aims to show that combining VR with traditional methods of treatment can exponentially increase patient benefits. This research paper also aims to convince the readers that implementing VR in clinics is essential in bringing about said patient benefits. The research procedure included analysing various articles on the topics of Virtual Reality, its advantages and disadvantages, exposure therapy, cue exposure therapy, various mental health disorders and case studies regarding the use of VR in their treatment etc. Results show that VR-based exposure therapy shows great potential in improving the various, existing treatment methods for countless mental disorders. With proper training and surveillance, VR could very well be implemented in clinics and prove very useful.

**Keywords:** Virtual Reality(VR), Exposure therapy, Cue-based exposure therapy, Anxiety, Substance abuse disorders.

**Subject:** Psychology, Technology

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## INTRODUCTION

Virtual Reality (VR) is an artificial environment created with specialised software or filmed with specific cameras that can be interacted with by users in a seemingly real way. It involves wearing an enclosed head-mounted device that shows three-dimensional visuals on a screen. Since these images are generated relative to the position of the headset, users can actively interact with objects and characters. Over 95% of the world's population suffers from various mental health issues<sup>1</sup>. According to WHO, there has been a 13% increase in mental health conditions and substance use disorders between 2007 and 2017<sup>2</sup>. Though there has been a surge in the development of medical technology, the developed tools aren't apt to combat such modern-day issues. A technology that aids existing treatment methods to more effectively approach such disorders is urgently needed. This technology could very well be VR. VR has already been used to provide exposure-based therapy in which patients are exposed to dreaded circumstances while being monitored. Numerous articles have been published showing the effectiveness of such treatments for mental health disorders including schizophrenia<sup>7</sup>, anxiety<sup>6</sup>, phobias, combat-associated PTSD<sup>3</sup> etc. Nevertheless, the actual clinical implementation of VR-based treatments is limited. This research paper aims to demonstrate that combining VR with traditional methods of treatment could exponentially increase patient benefits and convince the readers why implementing VR in clinics is integral to bringing about said patient benefits.

## MATERIALS AND METHODS

Research was carried out by analysing various articles and studies from Google Scholar regarding virtual reality, its advantages and disadvantages how these can be linked with mental wellness and various health issues like PTSD, anxiety etc, and exposure therapy.

## RESULTS AND DISCUSSION

The current methods of treatment pose several disadvantages including relying on the imagination of patients. In VR, required situations can be simulated and these surroundings can be controlled and manipulated by the therapist. It also allows for more personalised and intrusive treatment. For example, numerous reports indicate PTSD in returning Operation enduring Freedom/ Operation Iraqi Freedom military personnel. Rizzo et al. (n.d.) conducted a study using a set of customisable virtual scenarios to represent similar Middle Eastern scenarios for exposure

therapy. 16 out of the 20 treatment completers no longer met military criteria for PTSD after treatment<sup>3</sup>. Another major plus point includes the ability to capture data from users automatically during their VR journey. VR, though providing a plethora of advantages, does possess a few disadvantages too. The first and main concern is the high cost. This makes it harder to employ in clinical settings. Though this concern has validity, many smartphone-based VR kits are available at an affordable rate. The cost of recreating various scenarios in vivo is very expensive as well. Another disadvantage is the malfunctioning of the programme. Although VR technology has advanced, the likelihood of errors and glitches is never zero. A rather controversial disadvantage is addiction. Having entered a virtual world, one might never want to leave, leading to other physical altercations. A fine line between correct dose and overdose needs to be set. The final disadvantage includes the requirement of extra training to properly control and regulate the use of VR as a treatment tool in clinics.

Let us look into some more mental disorders that have been or are being treated with the help of VR to understand its full potential. According to WHO, in the first year of the COVID-19 pandemic, the occurrence of anxiety disorders grew by a massive 25%<sup>3</sup>. Anxiety is an emotion characterised by feelings of tension, worried thoughts and physical changes like increased blood pressure<sup>4</sup>. Though a study conducted by the National Institute of Mental Health found that over 50% of the people receiving therapy for anxiety do show a reduction in symptoms<sup>5</sup>, imagine the success rate if the current methods were combined with VR. A study conducted shows that VR technology has scope as an anxiety-provoking and treatment tool. It can also be used as a guide to practice mindfulness and various relaxation techniques<sup>6</sup>.

Schizophrenia is a severe mental illness which includes psychotic symptoms, disruptions to normal physical/emotional functioning and difficulty with cognitive processing<sup>4</sup>. For schizophrenia, the traditional treatment is social skills training (SST), which is quite effective. A randomised, controlled trial compared SST using VR role-playing and SST using traditional role-playing. Data were also obtained for motivation for SST and various social abilities. Throughout the sessions, the SST with VR group showed more interest in treatment. Post-treatment, the SST VR group improved more in conversational skills and assertiveness as compared to the SST with traditional role-playing group, but less in nonverbal skills. This shows that VR can be quite beneficial in improving conversational skills, and creating more immersive role-playing scenarios thereby aiding SST and increasing motivation to take part in SST for schizophrenic patients<sup>7</sup>.

Addiction is a chronic disorder with biological, physiological, social and environmental factors influencing its development and maintenance<sup>4</sup>. Smoking, a deadly form of addiction, kills over 8 million people a year. A study conducted aimed to investigate the effect of repeated virtual cue exposure therapy on the psycho physiological responses to nicotine dependence. Three-dimensional neutral and smoking-related environments were built using VR. Although the findings are preliminary, the study found that VR cue exposure therapy coupled with psycho physiological response surveillance could be an alternative treatment strategy for smoking cessation<sup>8</sup>.

Body Image (BI) is defined as the mental picture one forms of one's body as a whole and one's attitude towards these characters<sup>4</sup>. Body image issues involve building a negative feeling toward one's characters and being overly focused on comparing one's features to unrealistic ideals. Body image issues play a key role in Eating Disorders (ED). A study conducted by C Perpiñá et al. (n.d.) looked into the effectiveness of treating BI in ED using VR. The 13 participants were assigned to two groups; one underwent treatment using the standard body image treatment condition and the other one used the VR condition. The results showed that though there was no significant difference between both the conditions in general ED measure, in certain specific BI criteria, the group with VR condition showed greater improvement<sup>9</sup>. Another study conducted showed that VR treatment significantly improved the overall psychological state of patients suffering from body image disturbances and obesity. It was especially beneficial in improving body satisfaction, and self-efficacy and inducing a desire to reform. A decrease in poor eating and social habits may be linked to the results. Though the results are preliminary, they suggest that traditional weight reduction programmes may benefit from implementing VR-based short-term therapy<sup>10</sup>.

Having discussed a few case studies proving the efficacy of VR in the treatment of various mental disorders, let us look into how it can be incorporated into clinics and what extra training it requires. To introduce VR-based exposure therapy in clinics, specific training and equipment are essential. Both online and on-site training courses are offered by sellers. Training should also be provided on how to manage technical issues and glitches during treatment. Patients also need to be well assessed to know whether VR-based exposure therapy is a good treatment option for them. Sufficient technical training and supervision and support are prerequisites for VR therapy.

## **CONCLUSIONS**

Virtual reality has emerged as an effective tool to aid in the treatment of a variety of disorders, with the strongest evidence for use in exposure therapy for patients and cue exposure therapy for patients with substance abuse

disorders. Overall analysis shows that Virtual Reality is a powerful tool that has long-term impacts that transfer to the real world too.

#### REFERENCES

- [1]. ScienceDaily. (2015, June 8). *Over 95% of the world's population has health problems, with over a third having more than five ailments.* ScienceDaily. Retrieved June 11, 2022, from <https://www.sciencedaily.com/releases/2015/06/150608081753.htm>
- [2]. World Health Organization. (n.d.). *Mental health.* World Health Organization. Retrieved June 11, 2022, from [https://www.who.int/health-topics/mental-health#tab=tab\\_1](https://www.who.int/health-topics/mental-health#tab=tab_1)
- [3]. Difede, J. A., Rothbaum, B. O., Reger, G., Spitalnick, J., Cukor, J., & Mclay, R. (2010, October 18). *NYAS Publications - Wiley Online Library.* Development and early evaluation of the Virtual Iraq/Afghanistan exposure therapy system for combat-related PTSD. Retrieved June 11, 2022, from <https://nyaspubs.onlinelibrary.wiley.com/doi/abs/10.1111/j.1749-6632.2010.05755.x>
- [4]. American Psychological Association. (n.d.). *Apa Dictionary of Psychology.* American Psychological Association. Retrieved June 11, 2022, from <https://dictionary.apa.org/>
- [5]. U.S. Department of Health and Human Services. (n.d.). *Any anxiety disorder.* National Institute of Mental Health. Retrieved June 11, 2022, from <https://www.nimh.nih.gov/health/statistics/any-anxiety-disorder>
- [6]. Kim, K., Kim, C.-H., Cha, K. R., Park, J., Han, K., Kim, Y. K., Kim, J.-J., Kim, I. Y., & Kim, S. I. (2008, December 11). *Anxiety provocation and measurement using virtual reality in patients ...* Anxiety Provocation and Measurement Using Virtual Reality in Patients with Obsessive-Compulsive Disorder. Retrieved June 11, 2022, from <https://www.liebertpub.com/doi/abs/10.1089/cpb.2008.0003>
- [7]. Park, K.-M., Ku, J., Choi, S.-H., Jang, H.-J., Park, J.-Y., Kim, S. I., & Kim, J.-J. (2011, April 29). *A virtual reality application in role-plays of social skills training for schizophrenia: A randomized, controlled trial.* Psychiatry Research. Retrieved June 11, 2022, from <https://www.sciencedirect.com/science/article/abs/pii/S0165178111002848#>
- [8]. Choi, J.-S., Park, S., Lee, J.-Y., Jung, H.-Y., Lee, H.-W., Jin, C.-H., & Kang, D.-H. (2011, April 25). *The effect of repeated virtual nicotine cue exposure therapy on the psychophysiological responses: A preliminary study.* Psychiatry investigation. Retrieved June 11, 2022, from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3149111/>
- [9]. Perpiñá, C., Botella, C., Baños, R., Marco, H., Alcañiz, M., & Quero, S. (2009, January 29). *Body image and virtual reality in eating disorders: Is ... - liebertpub.com.* Body Image and Virtual Reality in Eating Disorders: Is Exposure to Virtual Reality More Effective than the Classical Body Image Treatment? Retrieved June 11, 2022, from <https://www.liebertpub.com/doi/10.1089/cpb.1999.2.149>
- [10]. Riva, G., Bacchetta, M., Baruffi, M., & Molinari, E. (2004, July 5). *Virtual reality-based multidimensional therapy for the treatment of ...* Virtual Reality-Based Multidimensional Therapy for the Treatment of Body Image Disturbances in Obesity: A Controlled Study. Retrieved June 11, 2022, from <https://www.liebertpub.com/doi/abs/10.1089%2F109493101750527079>