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FOSTERING THERAPEUTIC ALLIANCE AND LONG-TERM BENEFITS THROUGH VIRTUAL COLLABORATION IN VRET

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Abstract

Within the last decade, immersive virtual reality (iVR) has emerged as a transformative technology in the fields of psychology and psychotherapy, offering promising avenues for novel therapeutic approaches. The increasing demand for psychotherapeutic services and innovative methods to facilitate and enrich psychotherapeutic processes has underscored the unique potential of iVR such as accessibility, scalability, easy creation, and dynamic modification of the virtual content customization and safety. This paper explores the integration of collaborative immersive virtual environments (CIVEs) within Virtual Reality Exposure Therapy (VRET), aiming to extend the application of cognitive-behavioral therapy (CBT) techniques. Our investigation not only refines VRET as a contemporary CBT tool but places significant emphasis on the crucial role of therapeutic alliances and the enduring impact of successful interventions. Central to our discussion is the idea that CIVEs should facilitate meaningful interactions between therapists and clients in an immersive virtual realm, which we also attempt to support with our past and follow-up research. Beyond the conventional boundaries of VRET, our perspective advocates for expanding collaborative efforts to encompass traditional CBT sessions conducted within iVR. This deliberate expansion of virtual therapeutic involvement seeks to overcome geographical limitations that align with the evolving landscape of remote therapy while preserving the essential components of established therapeutic methods. We introduce a framework that not only embraces technological progress but also underscores the importance of cultivating strong therapeutic connections, thereby contributing to lasting treatment success.

Keywords: *iVR, CIVE, virtual reality, psychotherapy, cognitive-behavioral therapy.*

1. Introduction

Significant strides in iVR technologies have captivated researchers and experts from various fields of psychology. Considering VR's distinctive features such as interactivity, and multisensory approach, professionals have increasingly used it for research and various practical activities due to its cost-saving, accessibility, and user-friendliness (Boeldt, McMahon, McFaul, & Greenleaf, 2019; Slater, 2018). An escalating trend within contemporary psychotherapeutic paradigms involves the increasingly prevalent integration of VR as a substantive asset in therapeutic interventions (Olenichenko, 2023). One form of VR-based therapy is VRET for phobias, where one is systematically exposed to feared stimuli in a virtual environment (Roesmann et al., 2023). Among the most prevalent phobias is acrophobia - an intense and irrational fear of heights often co-occurring with other mental health issues (Menzies & Clarke, 1995). Symptoms include increased sweating, elevated heart rate, chest pain, palpitations, nausea, tremors, trembling, dizziness, or loss of balance (Kapfhammer et al., 2015). For acrophobia, CBT is the primary psychotherapeutic approach, with VRET being the common, and recently found to be a very effective, approach (Chou et al., 2021). The therapeutic alliance in CBT is considered essential for positive outcomes in therapy (Feindler & Smerling, 2022). It is argued that the therapeutic relationship is often secondary to technique in CBT training, receiving little attention (Easterbrook & Meehan, 2017).

In addition, nowadays, researchers can gain much insight into people's physical, mental, and emotional responses by combining VR with tools that measure signals from the body (Lee, El Ali, Wijntjes, & Cesar, 2022). The measurement of biosignals is imperative as it serves as a crucial avenue for gaining deeper insights into individuals' emotions, behavior, and overall experiential responses (Giannakakis et al., 2022). Heart rate (HR) is the most common physiological measure for stress, while heart rate variability (HRV) proves more sensitive to emotional states. HRV reflects fluctuations in beat-to-beat intervals, indicating parasympathetic and sympathetic nervous system activity (Duong et al.,

2020). This nuanced measure allows for an objective assessment of an individual's mental state during VRET (Ihmig et al., 2020).

In the wake of technological advancements and expansions, contemporary innovations have yielded sophisticated platforms such as CIVE. Developed to foster collaboration, the CIVE platform facilitates virtual interaction among multiple participants, promising advantages such as diminished waiting times, erase the need for physical presence, and heightened operational efficiency (Conesa, Mula, Bartlett, Naya, & Contero, 2023; Juřík, Herman, Kubíček, Stachoň, & Šašinka, 2016). Notably, CIVEs exhibit personalized characteristics, affording adjustments to replicate real-life interactions and influencing the dynamics of collaborative relationships (De Back, Tinga, & Louwerse, 2023).

Building upon the aforementioned elements, our focus shifts towards their combination – integrating CIVEs into the framework of VRET, while concurrently incorporating physiological measurements. The objective is to broaden the application of CBT techniques within the current state of knowledge in combination with the latest technology. In addition to enhancing VRET as a contemporary CBT tool, we want to place a heightened emphasis on the importance of exploring how this latest approach might affect therapeutic adherence and the lasting effects of successful interventions.

2. State of the art

VRET and VR CBT have undoubtedly become an irreplaceable and advantageous methods for treating acrophobia in today's world (Donker & Heinrichs, 2023). For certain individuals, consistent attendance at CBT sessions may present challenges, stemming from geographical constraints, transportation limitations, or other logistical issues. Factors such as residing in remote locations, lack of accessible transportation, or time constraints due to busy schedules can impede regular in-person attendance, potentially leading to weakened results in both treatment effectiveness and therapeutic alliance. In response to these challenges, transitioning to fully remote or virtual collaborations between therapists and clients emerges as a potential solution, that researchers are beginning to explore. This can also be supported by the discovery from Rogers et al. (2022) that virtual reality interactions closely resemble in-person interactions. In the realm of current remote psychotherapy setting, conventional telehealth approaches such as videoconferencing and telephone sessions are prevalent. On the other hand, Pedram et al. (2020) study, exploring counseling sessions in both VR and Skype platforms, revealed a noteworthy superiority of VR over Skype. VR surpassed Skype in crucial dimensions, excelling as a therapeutic tool, enhancing session realism, and delivering a heightened sense of presence. All those factors are crucial during therapy; therefore, VRET again shows more potential in remote possibilities.

Li and Yip (2023) introduced a pilot case study that marks the pioneering investigation into the integration of CIVE and therapeutic practices. In this study, the authors explored the viability of employing a custom CIVE for remote arts therapy. Conducted exclusively within the CIVE, both quantitative and qualitative data indicated the approach's feasibility, well-received by both participants and the therapist. Another innovative attempt was made only recently by Moldoveanu et al. (2023), who focused on linking VRET with biosignals acquisition. Their prototype system features scenarios designed for acrophobia, claustrophobia, and fear of public speaking therapy, during which users engage in gamified tasks, navigating VR environments while their biophysical data (electrodermal activity and HR) is acquired. The system integrates automatic anxiety level classification, biofeedback within scenes, and dynamic virtual environment adaptation. A dedicated application serves as a control panel for psychotherapists, managing patient profiles and therapy sessions. Qualitative feedback from subjects and psychotherapists validated the prototype, offering insights for refinement. Anyway, we can't forget about the remaining questions arising from the research mentioned above - How might the absence of the therapist in the virtual environment and his/her guidance within the VRET affect the participant? Research suggests that in VRET, sessions led by psychologists prioritize building a strong therapeutic relationship through mutual task and goal setting, yielding enhanced treatment outcomes and improved adherence (Buchholz & Abramowitz, 2020). The crucial role of psychological guidance in VR exposure therapy cannot be overstated, yet this remains an under-explored domain. Despite the attention some experts give to automated interventions and their potential impact, the true value and effectiveness of fundamental human guidance in the same context remains somewhat uncertain and open to interpretation. That is why we have decided to delve into the issue in part.

To summarize, while ongoing research emphasizes efficiency and technological advancements, the synergy between VRET and CIVE integrating physiological measurements like HRV remains largely unexplored. This uncharted territory represents an unprecedented convergence, offering an ideal platform for therapists and clients dealing with acrophobia. The incorporation of CIVE into VRET not only marks an innovative stride in mental health treatment but also unlocks avenues for more accessible,

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personalized, and efficient therapy experiences. The utilization of HRV as an objective indicator further enhances the potential for assessing the client's mental state during exposure sessions.

3. Revelations from our study

In our previous research endeavor, we delved into the anxiety experiences of individuals with a moderate fear of heights when confronted with height situations in VR, aligning with the prevalent trend of utilizing VR in phobia psychotherapy. The primary objective was to discern disparities in HRV between two participant groups – those with and without psychological guidance during exposure to height scenarios in an immersive virtual environment. Additionally, we sought to examine potential variations in scores on the self-assessing (subjective) anxiety questionnaire between these groups. These assessments aimed to illuminate participants' anxiety experiences in a VR-based height situation and gauge the impact of psychological guidance on such encounters. Notably, our findings based on objective physiological measures underscored that participant receiving psychological guidance demonstrated heightened preparedness in managing anxiety compared to their counterparts without psychological support. This guidance not only reduced anxiety but also enhanced mental resilience in handling stress and deepened cathartic experiences without escalating anticipatory nervousness. Furthermore, participants with psychological guidance exhibited a more profound cathartic response post-height exposure, evident in a steeper decline in HR values. The study illuminated that anxiety in psychologically guided participants diminishes gradually, while non-guided participants experience unevenly intense, recurring waves of anxiety (Varšová et al., unpublished manuscript).

Our results underscored the rationale for using objective data as HRV, as the difference in subjective questionnaires not only failed to show differences across groups, but such subjective and rigid data did not provide additional, beneficial, insights into the lived experiences of participants, and consequently, in practical application, clients.

4. Crafting the future and harvesting of benefits

Where will the next research steps take us? First of all, to the combination of information and approaches highlighted so far. The focus should center on the meticulous development of an optimal CIVE application for therapists and clients engaging in VRET. This endeavor, same as for any other project, should entail a systematic approach involving pivotal steps: an in-depth exploration of the topic, formulation of a robust methodology, and practical testing through piloting the virtual environment. By thoroughly examining existing knowledge, assimilating insights from the literature, and translating these findings into practical guidelines, our research should establish a solid foundation for implementing optimal CIVE settings. The subsequent piloting phase will offer opportunities for real-world testing, the collection of valuable feedback, and the refinement of the virtual environment based on the experiences of both therapists and clients. We decided to include in the pivot testing collaboration with CBT experts whose experience with exposure therapy can provide beneficial insights and allow us to modify and refine the application into a final, high-quality, and effective treatment. It can subsequently also improve CBT therapist's attitude and increase the chance of using this technology in their practice in the future (Rimer, Husby, & Solem, 2021)

Our motivation for this project is to open the door for long-term collaboration between client and therapist within a virtual environment. Most studies in VRET targeting acrophobia (but also other phobias) are frequently administered as a one-time session, this setting does not lead to deeper collaboration or the acquisition of an alliance (Diemer, Lohkamp, Mühlberger, & Zwanzger, 2016; Chou et al., 2021). The duration of VRET sessions exhibits considerable variation across studies. For single-session therapy to be efficacious, the exposure duration needs to extend to at least 60 minutes but could last up to 3 hours (Kahlon, Lindner, & Nordgreen, 2019). However, for optimal effectiveness in VRET, sessions should last at least 15–20 minutes, particularly when multiple sessions (a minimum of 4) are incorporated into the therapeutic regimen (Krzystanek et al., 2021). For these particular reasons, we consider it more beneficial to use the second approach - namely repeated exposures and performing an average of one VR exposure per week.

5. Exploring potential challenges

However, it is important to acknowledge that implementing entirely remote therapeutic modalities may introduce its own set of challenges, such as ensuring reliable internet connectivity, face possible data leaks, maintaining a secure virtual environment, and addressing potential barriers to

effective communication. Striking a balance between the advantages of remote accessibility and the potential hurdles associated with fully virtual interactions remains a critical consideration in expanding the reach and effectiveness of therapeutic interventions.

6. Conclusion

In the past decade, iVR has revolutionized psychology and psychotherapy, offering promising avenues for innovative therapeutic approaches. This conference paper explores the integration of CIVEs into VRET, refining it as a contemporary CBT tool. Emphasizing the role of therapeutic alliances and the enduring impact of interventions, CIVEs in the right setting can facilitate meaningful interactions in an immersive virtual realm. Beyond conventional VRET boundaries, we advocate for expanding collaborative efforts to encompass traditional CBT sessions within iVR, overcoming geographical limitations in the evolving landscape of remote therapy. The framework introduced supports technological progress while underscoring the importance of cultivating strong therapeutic connections for lasting treatment success.

Building on findings from our previous study exploring anxiety experiences in fear of heights in VR, which emphasized the value of psychotherapeutic guidance and objective physiological measures HRV, our future path is aiming to develop an optimal CIVE app for therapists and clients in VRET. This involves fostering long-term collaboration within a virtual environment. While acknowledging challenges in remote therapeutic modalities, the paper advocates striking a balance between remote accessibility advantages and potential hurdles. The research avenue includes the proposal of an application that dynamically modifies exposure to virtual content while monitoring participants' physiological responses, contributing to the evolving landscape of VR-based CBT.

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