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A Comparison of the Effectiveness of Virtual Reality Exposure Therapy with Cognitive-Behavioral Therapy on Ambiguity Tolerance in Individuals with Obsessive-Compulsive Disorder

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Extended Abstract

Aim

Obsessive-Compulsive Disorder (OCD) is known to disrupt social interactions, family functioning, participation in group activities, and workplace engagement (Gillet et al., 2018). Therefore, addressing the challenges faced by individuals with OCD, the primary objective of this study was to compare the effectiveness of Virtual Reality Therapy (VRT) and cognitive-behavioral therapy (CBT) in enhancing tolerance for ambiguity among those suffering from OCD.

Methodology

This study employed a quasi-experimental design with a pre-test/post-test format, a control group, and a two-month follow-up assessment. The study population comprised all clients of the NikMehr Counseling Center in Tehran during the years 2018-2019. Following the recommendations of Gall, Borg, & Gall (1996), to enhance internal validity, the sample size for experimental studies should consist of at least 15 participants per group. Based on a cutoff score of 11 on the Maudsley Obsessive Compulsive Questionnaire (MOCQ) (Hodson & Rachman, 1977) and a diagnostic interview conducted by a clinical therapist in accordance with DSM-5 criteria, 45 individuals were diagnosed with OCD. These participants were selected through purposeful sampling and randomly assigned to either the control or experimental groups (15 participants in the VRT group, 15 in the CBT group, and 15 in the control group).

Inclusion criteria included: being aged between 18 and 45, a diagnosis of OCD based on a cutoff score of 11 on the MOCQ (Hodson & Rachman, 1977), a diagnostic interview by a clinical psychologist based on DSM-5 criteria, possession of at least a middle school certificate, absence of serious medical or psychiatric disorders such as psychosis or personality disorders as determined by a psychiatrist, a clean record of substance abuse and addiction according to psychiatric files, and obtaining written consent from participants. Exclusion criteria comprised taking psychiatric medications for obsession treatment, receiving other psychological therapies concurrently before entering the study, and failure to attend two consecutive sessions.

The instruments utilized in this study included the Maudsley Obsessive Compulsive Questionnaire (MOCQ) (Hodson & Rachman, 1977) and the Ambiguity Tolerance Questionnaire (ATQ) (McLain, 1993). Additionally, a Gear 360 camera and a virtual reality headset (VR SHANECON) (Belloch et al., 2014) were employed. Adobe After Effects and Adobe Premiere Pro software were used for editing and modifying images. Furthermore, KM Player VR, a powerful virtual reality software for Android developed by Mplayer Company and later by PANDORA.TV, was utilized for video playback. This software allowed for viewing virtual reality movies without an Internet connection,

using content stored on the mobile device. The subjects were subjected to cognitive-behavioral therapy (Leahy, Holland & McGinn, 2011) for 12 sessions (2 forty-five-minute sessions per week for 6 weeks) and virtual reality exposure for 12 sessions (2 eight-minute sessions per week for 6 weeks). No intervention was administered to the control group. The data was analyzed in SPSS.23 software using a Bonferroni post hoc test and mixed analysis of variance.

Findings

In this study, 45 patients (25 women and 20 men) diagnosed with OCD participated, with average ages of 34.00 for the Virtual Reality Therapy (VRT) group, 35.47 for the cognitive-behavioral therapy (CBT) group, and 34.13 for the control group. The results indicated a significant main effect of the time factor. The average scores for ambiguity tolerance showed a significant difference from the pre-test stage to both the post-test stage and follow-up ($p = 0.001$, $F(1, 42) = 47.93$, $\eta^2 = 0.53$). Additionally, the overall research groups exhibited a significant difference in ambiguity tolerance scores ($p = 0.001$, $F(2, 42) = 19.63$, $\eta^2 = 0.46$). The interaction between time and group membership (research conditions) was also statistically significant. Notably, there was a significant change in the average ambiguity tolerance scores between the experimental and control groups from pre-test to post-test and follow-up ($p = 0.001$, $F(2, 42) = 14.029$, $\eta^2 = 0.40$). The statistical power of 1 indicates an appropriate sample size for these conclusions, with group membership accounting for 40% of the variance in changes in ambiguity tolerance scores from pre-test to post-test and follow-up. However, there was no significant difference between the effectiveness of VRT and CBT regarding tolerance for ambiguity ($p > 0.05$). There was only a significant difference in the improvement of tolerance for ambiguity when comparing both treatment groups to the control group ($p < 0.05$).

Conclusion

The results of this study demonstrated that both VRT and CBT are effective in enhancing tolerance for ambiguity in individuals with OCD. These findings align with previous studies by Remmerswaal et al. (2021), which highlighted the efficacy of cognitive-behavioral therapy and virtual reality exposure therapy in alleviating symptoms of OCD. Follow-up assessments revealed no significant difference in the effectiveness of these treatments on ambiguity tolerance among individuals with OCD.

Practical techniques, such as cognitive restructuring to address obsessive thoughts and the development of behavioral skills like confrontation and response prevention, are taught to OCD patients through CBT (Remmerswaal et al., 2021). With practice and repetition, these methods contribute to improved ambiguity tolerance. The advantages of VRT include its lack of side effects and the opportunity it provides patients to engage in tasks with a sense of presence and manageable anxiety levels in a controlled environment. This approach enables patients to gain control over their fears and move beyond their established behavioral patterns (Cullen et al., 2021). Additionally, VRT fosters a sense of self-efficacy in patients, enhancing their confidence and mental resilience. Importantly, VRT is closely monitored by therapists and can be terminated if it becomes overwhelming for the patient.

Like any research study, this investigation had limitations. The sample was limited to individuals with OCD who received counseling and psychological services from the NikMehr Center in Tehran. Furthermore, the study did not control for personality, physiological, social, and family variables that might influence the ambiguity tolerance of individuals with OCD, nor did it employ random sampling methods.

Keywords: Cognitive-behavioral Therapy, Obsessive Compulsive Disorder, Tolerance of Ambiguity, Virtual Reality Therapy.

Ethical Considerations

1. Participants were provided with a self-introduction and a brief explanation of the study's purpose, including the nature of their cooperation, the benefits of the research, and the importance of completing the questionnaires.
2. Written consent was obtained from participants for their involvement in the study.
3. Participants were assured of their permission to complete the questionnaires at their discretion.

4. Participants were informed about the privacy and confidentiality of their information.
5. Participants were assured they could withdraw from the study and discontinue treatment at any time without any consequences.
6. Data collection and interviews were conducted with the agreement of participants regarding the time and location.
7. Participants were assured that data would be analyzed collectively to maintain anonymity in the reporting of results.
8. Information obtained from the study would be used solely for scientific purposes.
9. Research results would be presented to participants upon request.
10. Participants were assured that all information gathered from the study would be securely stored and inaccessible to unauthorized individuals.
11. The rights of all participants were fully protected throughout the research process.

It should be noted that this research received ethics approval under ID: IR.IAU.KHUISF.REC.1399.281 from the Research Ethics Committee of Islamic Azad University of Isfahan, which can be accessed on the website of the National Ethics System in Biomedical Research.

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Conflict of Interest

The authors declare that there are no conflicts of interest related to this research, nor has any financial support been received from or provided to any organization in connection with this study.

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