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Research protocol

Predictors of the Effectiveness of Immersive VR-based Interventions for Stress Reduction: A Protocol for a Systematic Review with Meta-Analysis

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Background: Over the past years, the prevalence of mental load has been continuously increasing. Persistent stress is associated with poor mental health and various diseases. Stress management techniques enable individuals to cope with these demands and reduce the negative health consequences of stress. While Virtual Reality (VR) has been shown to be an effective treatment for a range of psychiatric conditions, studies also suggest its potential to reduce stress and enhance mental well-being in the general population. However, predictors of the efficacy of different VR interventions for stress reduction remain unknown. This systematic review aims to compare the effectiveness of VR interventions for stress reduction across various application areas.

Methods: MEDLINE, CINAHL, CENTRAL, PsychINFO, and Web of Science will be searched in accordance with PRISMA guidelines to identify randomized controlled trials of immersive VR interventions for stress reduction. Studies will be included if they address the general population without psychological diagnoses and compare a VR intervention with a control group, such as no treatment, placebo, or waitlist control groups. At least one validated measure of perceived psychological stress must be reported. Data extraction will be performed by two reviewers. Pooled standardized mean differences will be calculated for the primary outcome of perceived stress. Meta-regression and subgroup analyses will be conducted to identify predictors of treatment effects and possible differences among subgroups. As secondary outcomes, biological stress markers, anxiety, depression, and health-related quality of life will be analyzed. A comparison of VR interventions with traditional stress management approaches will also be performed.

Discussion: The results will provide a comparative overview of existing research on VR interventions for stress reduction outside psychiatric applications and will assist in identifying future research agendas.

Keywords: effectiveness, stress management, stress, virtual reality, coping, VR intervention, stress reduction, predictors, meta-analysis

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