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Single-Case Experimental Design: Exploratory Pilot Study on the Feasibility and Effect of Virtual Reality for Pain and Anxiety Management During Care

Authors : Corbel Camille, Le Cerf Flora, Corveleyn Xavier

Abstract : Introduction: Aging is a physiological phenomenon accompanied by anatomical and cognitive changes leading to anxiety and pain. This could have significant impacts on quality of life, life expectancy, and the progression of cognitive disorders. Virtual Reality Intervention (VRI) is increasingly recognized as a non-pharmacological approach to alleviate pain and anxiety in children and young adults. However, while recent studies have explored the feasibility of applying VRI in the older population, confirmation through studies is still required to establish its benefits in various contexts. Objective: This pilot study, following a clinical trial methodology international recommendation for VRI in healthcare, aims to evaluate the feasibility and effects of using VRI with a 101-year-old woman residing in a nursing home undergoing weekly painful and anxious wound dressing changes. Methods: Following the international recommendations, this study focused on feasibility and preliminary results. A Single Case Experimental Design protocol consists of two distinct phases: control (Phase A) and personalized VRI (Phase B), each lasting for 6 sessions. Data were collected before, during and after the care, using measures of pain (Algoplus and numerical scale), anxiety (Hospital anxiety scale and numerical scale), VRI experience (semi-structured interview) and physiological measures. Results: The results suggest that the utilization of VRI is both feasible and well-tolerated by the participant. VRI contributed to a decrease in pain and anxiety during care sessions, with a more significant impact on pain compared to anxiety, which showed a gradual and slight decrease. Physiological data, particularly those related to stress, also indicate a reduction in physiological activity during VRI. Conclusion: This pilot study confirms the feasibility and benefits of using virtual reality in managing pain and anxiety in an older adult in a nursing home. In light of these results, it is essential that future studies focus on setting up randomized controlled trials (RCTs). These studies should involve a representative number of older adults to ensure generalizable data. This rigorous, controlled methodology will enable us to assess the effectiveness of virtual reality more accurately in various care settings, measure its impact on clinical parameters such as pain and anxiety, and explore the long-term implications of this intervention.

Keywords : anxiety reduction, nursing home, older adult, pain management, virtual reality
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