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Virtual reality-based supportive care interventions for patients with cancer: an umbrella review of systematic reviews and meta-analyses

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Abstract

Purpose: This umbrella review aimed to identify, critically appraise, and synthesize current evidence from systematic reviews and meta-analyses on the applications of virtual reality-based supportive care interventions in cancer.

Methods: Three bibliographic databases were searched from inception to February 1, 2024. Two independent reviewers screened the titles and abstracts of 421 records and retrieved 26 full-text systematic reviews. Assessing the Methodological Quality of Systematic Reviews 2 (AMSTAR-2) was used for quality assessment. Qualitative syntheses were performed to investigate the effects of virtual reality-based supportive care interventions on quality of life and physical, psychological, cognitive, and functional outcomes. Meta-analysis was performed based on data from the distinct primary studies that were extracted from the included reviews.

Results: This umbrella review included 20 systematic reviews that were published between 2018 and 2023; nine of them conducted meta-analyses. A total of 86 distinct primary studies were identified. According to the AMSTAR-2 assessment, two reviews were evaluated as moderate quality, nine as low, and nine as critically low. Meta-analyses of primary studies revealed significant effects of virtual reality on anxiety ($p < 0.001$), depression ($p < 0.001$), and pain ($p < 0.001$), but not fatigue ($p = 0.263$). Qualitative syntheses revealed positive effects of virtual reality on physical function, cognitive function, and quality of life. Limited evidence was reported regarding outcomes of balance, gait, mobility, and activities of daily living.

Conclusion: Virtual reality has proven to be a safe and feasible approach to deliver supportive care in cancer. Virtual reality can be implemented in various stages and settings of the cancer care continuum to support patients undergoing painful procedures, during or after chemotherapy, and after surgical interventions. Virtual reality can serve as an effective supportive care intervention to manage anxiety, pain, and depression for patients with cancer.

Keywords: Function; Neoplasm; Oncology; Pain; Simulation; Virtual reality.

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