

## Effects of Virtual Reality on Relieving Postoperative Pain in Surgical Patients: A Systematic Review and Meta-Analysis

**Authors :** Lingyu Ding, Hongxia Hua, Hanfei Zhu, Jinling Lu, Qin Xu

**Abstract :** Background: Postoperative pain is a prevalent problem leading to many adverse outcomes in surgical patients. Virtual reality (VR) is an emerging non-pharmacological method of postoperative pain relief, but the effects of it are not clear. This review aimed to explore the effects of VR on relieving postoperative pain. Methods: We searched PubMed, Embase, Web of Science, and other databases from inception to November 2019 to get the eligible studies. Meta-analyses were conducted to compare VR and usual care for relieving postoperative pain. Subgroup analyses and sensitivity analyses were performed to explain the heterogeneity. Results: Overall, 8 randomized control trials (RCTs) enrolling 723 participants were included. Our results demonstrated that the patients receiving the VR intervention had lower postoperative pain scores than those receiving the usual care. One subgroup analysis revealed that VR could relieve postoperative pain both in minor surgery and major surgery. Another subgroup analysis demonstrated a significant reduction in postoperative pain among patients receiving VR during the intraoperative and the postoperative periods. However, there was no significant postoperative pain relief when receiving VR during the preoperative period. Additionally, significant improvements in postoperative satisfaction were reported in two studies. However, another two studies included found that VR could not affect physiological parameters related to pain. Conclusion: Applying VR can relieve postoperative pain effectively. The type of surgery and timing of using VR are the main sources of heterogeneity. More rigorous studies about the relationship between VR and postoperative pain relief will be needed.

**Keywords :** meta-analysis, postoperative pain, systematic review, virtual reality

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