

## The Effects of Virtual Reality Technology in Maternity Delivery: A Systematic Review and Meta-Analysis

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**Abstract :** Background: Childbirth is considered a critical traumatic event throughout our lives, positively or negatively impacting the mother's physiology, psychology, and even the whole family. Adverse birth experiences, such as labor pain, anxiety, and fear can negatively impact the mother. Studies had shown that the immersive nature of VR can distract attention from pain and increase focus on interventions for pain relief. However, the existing studies that applied VR to maternal delivery were still in their infancy and showed disparate results, and the small sample size is not representative, so this review analyzed the effects of VR in labor, such as on maternal pain and anxiety, with a view to providing a basis for future applications. Search strategy: We searched Pubmed, Embase, Web of Science, the Cochrane Library, CINAHL, China National Knowledge Infrastructure, Wan-Fang database from the building to November 17, 2021. Selection Criteria: Randomized controlled trials (RCTs) that intervened the pregnant women aged 18-35 years with gestational >34 weeks and without complications with VR technology were contained within this review. Data Collection and Analysis: Two researchers completed the study selection, data extraction, and assessment of study quality. For quantitative data we used MD or SMD, and RR (risk ratio) for qualitative data. Random-effects model and 95% confidence interval (95% CI) were used. Main Results: 12 studies were included. Using VR could relieve pain during labor (MD=-1.81, 95% CI (-2.04, -1.57),  $P < 0.00001$ ) and active period (SMD=-0.41, 95% CI (-0.68, -0.14),  $P = 0.003$ ), reduce anxiety (SMD=-1.39, 95% CI (-1.99, -0.78),  $P < 0.00001$ ) and improve satisfaction (RR = 1.32; 95% CI (1.10, 1.59);  $P = 0.003$ ), but the effect on the duration of first (SMD=-1.12, 95% CI (-2.38, 0.13),  $P=0.08$ ) and second (SMD=-0.22, 95% CI (-0.67, 0.24),  $P=0.35$ ) stage of labor was not statistically significant. Conclusions: Compared with conventional care, VR technology can relieve labor pain and anxiety and improve satisfaction. However, extensive experimental validation is still needed.

**Keywords :** virtual reality, delivery, labor pain, anxiety, meta-analysis, systematic review

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