INPLASY

Virtual reality for pain and anxiety during outpatient hysteroscopy: a systematic review and meta-analysis of randomized controlled trials

INPLASY202640039

doi: 10.37766/inplasy2026.4.0039

Received: 11 April 2026

Published: 11 April 2026

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ADMINISTRATIVE INFORMATION

Support - No funding was received for this study.

Review Stage at time of this submission - Completed but not published.

Conflicts of interest - None declared.

INPLASY registration number: INPLASY202640039

Amendments - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 11 April 2026 and was last updated on 11 April 2026.

INTRODUCTION

Review question / Objective This systematic review and meta-analysis aimed to evaluate the effectiveness of virtual reality (VR) for reducing pain and anxiety during outpatient hysteroscopy, and to assess its effects on heart rate and the very satisfied rate.

Condition being studied Outpatient hysteroscopy, a minimally invasive procedure for the diagnosis and treatment of intrauterine lesions, in which procedural pain and anxiety remain important barriers to wider clinical implementation.

METHODS

Participant or population Adult women aged 18 years or older undergoing office hysteroscopy, regardless of race, nationality, or menopausal status.

Intervention VR intervention administered during office hysteroscopy, without restriction on device type or VR content. Interventions included immersive, interactive, or passive-viewing VR delivered through head-mounted devices.

Comparator Routine care during office hysteroscopy, including standard hysteroscopy care, preprocedural or intraprocedural pharmacological analgesia, verbal reassurance, or no active intervention.

Study designs to be included Randomized controlled trials.

Eligibility criteria Randomized controlled trials (RCTs).
Adult women undergoing office hysteroscopy.
Direct comparison between VR intervention and routine care.
Reporting at least one of the following outcomes: pain score during the procedure, heart rate during the procedure, anxiety score during the procedure, or the very satisfied rate.
Studies published in English.

Information sources The literature search was conducted in PubMed, Embase, the Cochrane Central Register of Controlled Trials (CENTRAL), and Web of Science, from database inception to April 4, 2026. Reference lists of included studies were also manually searched.

Main outcome(s) Pain score during the procedure, Heart rate during the procedure, Anxiety score during the procedure, Very satisfied rate.

Quality assessment / Risk of bias analysis Risk of bias was assessed using the Cochrane Risk of Bias 1.0 (RoB 1.0) tool across seven domains, including random sequence generation, allocation concealment, blinding of participants and personnel, blinding of outcome assessment, incomplete outcome data, selective reporting, and other bias.

Strategy of data synthesis Meta-analysis was performed using RevMan 5.4. Continuous outcomes were expressed as mean differences (MD) or standardized mean differences (SMD) with 95% confidence intervals (CI), and dichotomous outcomes as risk ratios (RR) with 95% CI. Fixed-effect or random-effects models were selected according to heterogeneity assessed by the I^2 statistic and the Q test. Publication bias was assessed using Begg's test and Egger's test in Stata 17.0.

Subgroup analysis Subgroup analyses were conducted for pain scores according to analgesic use and type of VR content.

Sensitivity analysis Sensitivity analysis was performed using a leave-one-out approach for outcomes with heterogeneity.

Country(ies) involved China.

Keywords Virtual reality; Office hysteroscopy; Pain; Anxiety; Meta-analysis; Randomized controlled trial.

Contributions of each author
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