

# INPLASY PROTOCOL

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**Conflicts of interest:**  
None declared.

## Virtual reality and labor pain

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**Review question / Objective:** Can virtual reality be helpful as an effective method in pain reduction during labor?

**Condition being studied:** Pain during the labor process.

**Eligibility criteria:** 1) randomized controlled trials studies addressing VR applications for relieving labor pain 2) control group should receive usual care in the labor ward 3) participants could be multipar or nulliparous, low-risk term pregnant women with no limit on age or ethnicity. 4) intervention is defined as any VR-based intervention performed through head-mounted displays or glasses with any content or duration and any level of immersion. 5) The intervention can be received at any stage of labor 6) the pain should be measured quantitatively with valid pain assessment tools. 7) We didn't exclude articles that were allowed access to analgesia throughout labor.

**INPLASY registration number:** This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 11 October 2021 and was last updated on 11 October 2021 (registration number INPLASY2021100035).

### INTRODUCTION

**Review question / Objective:** Can virtual reality be helpful as an effective method in pain reduction during labor?

**Condition being studied:** Pain during the labor process.

### METHODS

**Search strategy:** Pubmed - (labor[tiab] OR labour[tiab] OR delivery[tiab] OR pregnan\*[tiab] OR Childbirth[tiab] OR Birth\*[tiab] OR parturition[tiab] OR episiotomy[tiab] OR "Uterine Contraction\*" [tiab] OR Cesarean[tiab] OR

Labor, Obstetric[MESH] OR "Labor Pain" [MESH]) ("Virtual Reality"[tiab] OR VR[tiab] OR "extended reality"[tiab] OR "mixed reality"[tiab] OR "augmented reality"[tiab] OR "simulated reality"[tiab] OR "immersive reality"[tiab] OR "computer simulation"[tiab] OR "virtual environment"[tiab] OR "artificial environment"[tiab] OR "simulated environment"[tiab] OR "simulated three-dimensional environment"[tiab] OR "virtual system"[tiab] OR smartglasses[tiab] OR HMD[tiab] OR head mount\*[tiab] OR "Virtual Reality Exposure Therapy"[MESH] OR "Virtual Reality"[MESH]). Web of Science - TS=(labor OR labour OR delivery OR pregnan\* OR Childbirth OR Birth\* OR parturition OR episiotomy OR "Uterine Contraction\*" OR Cesarean) AND TS=("Virtual Reality\*" OR VR OR "extended reality\*" OR "mixed reality\*" OR "augmented reality\*" OR "simulated reality\*" OR "immersive reality\*" OR "computer simulation" OR "virtual environment" OR "artificial environment" OR "simulated environment" OR "simulated three-dimensional environment" OR "virtual system\*" OR smartglasses OR HMD OR head mount\*) Scopus - TITLE-ABS(labor OR labour OR delivery OR pregnan\* OR Childbirth OR Birth\* OR parturition OR episiotomy OR "Uterine Contraction\*" OR Cesarean) AND TITLE-ABS("Virtual Reality\*" OR VR OR "extended reality\*" OR "mixed reality\*" OR "augmented reality\*" OR "simulated reality\*" OR "immersive reality\*" OR "computer simulation" OR "virtual environment" OR "artificial environment" OR "simulated environment" OR "simulated three-dimensional environment" OR "virtual system\*" OR smartglasses OR HMD OR "head mount\*") EMBASE - (labor:ab,ti OR labour:ab,ti OR delivery:ab,ti OR pregnan\*:ab,ti OR Childbirth:ab,ti OR Birth\*:ab,ti OR parturition:ab,ti OR episiotomy:ab,ti OR "Uterine Contraction\*":ab,ti OR Cesarean:ab,ti) AND ("Virtual Reality\*":ab,ti OR VR:ab,ti OR "extended reality\*":ab,ti OR "mixed reality\*":ab,ti OR "augmented reality\*":ab,ti OR "simulated reality\*":ab,ti OR "immersive reality\*":ab,ti OR "computer simulation":ab,ti OR "virtual environment":ab,ti OR "artificial

environment":ab,ti OR "simulated environment":ab,ti OR "simulated three-dimensional environment":ab,ti OR "virtual system\*":ab,ti OR smartglasses:ab,ti OR HMD:ab,ti OR "head mount\*":ab,ti).

**Participant or population:** Primigravid or multi gravid low risk term pregnant women in latent or active phase of labor.

**Intervention:** Application of virtual reality through head-mounted displays or glasses with any content and any level of immersion.

**Comparator:** Women receiving usual and standard care in labor ward.

**Study designs to be included:** Randomised controlled trials.

**Eligibility criteria:** 1) randomized controlled trials studies addressing VR applications for relieving labor pain 2) control group should receive usual care in the labor ward 3) participants could be multipar or nulliparous, low-risk term pregnant women with no limit on age or ethnicity. 4) intervention is defined as any VR-based intervention performed through head-mounted displays or glasses with any content or duration and any level of immersion. 5) The intervention can be received at any stage of labor 6) the pain should be measured quantitatively with valid pain assessment tools. 7) We didn't exclude articles that were allowed access to analgesia throughout labor.

**Information sources:** We will conduct a systematic electronic search of Pubmed, Scopus, Web of Science and EMBASE.

**Main outcome(s):** Reduction in pain.

**Quality assessment / Risk of bias analysis:** We will use Modified Downs and Black Checklist for quality Assessment and exploring the potential risk of bias in included studies.

**Strategy of data synthesis:** Mean scores and standard deviations in experimental and control groups will be extracted from

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included articles where possible. A quantitative synthesis is planned provided the information is sufficiently homogenous. We plan to use STATA version 11 statistical software for All statistical analyses. Random effects models will be used to perform the meta-analysis and I2 statistics to assess heterogeneity across studies. Subgroup analysis will be conducted to explore heterogeneity where appropriate.

**Subgroup analysis:** Subgroup analyses will be performed if sufficient data are available to compare the effect of VR varies based on the stages of labor, components of pain, generation of virtual reality technology, and level of immersion employed.

**Sensitivity analysis:** We will use funnel plot to identify the possible publication bias.

**Country(ies) involved:** Iran.

**Keywords:** labor pain; pain; labor; virtual reality; VR; protocol; systematic review.

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