
Review

Virtual Reality on pediatric pain and fear during procedures involving needles: a systematic Review and Meta-analysis

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Abstract

Background: Virtual reality (VR) is used as a distraction measure during painful clinical procedures.

Objective: The objective of the study was to collect and analyze the evidence regarding the effectiveness of VR as a tool to distract children from pain and fear during needle procedures, as compared to standard techniques.

Methods: A systematic review and meta-analysis was performed. Studies were those whose main distraction measure was VR in a sample aged less than 21 years old that evaluated the pain generated by a needle during medical procedures. Databases included: PubMed, the Web of Science, Scopus, Psycinfo, Cinahl, and Cochrane. Among 665 unique search results, publications were included if they used VR as a distraction measure and if they evaluated the pain generated by a needle procedure. For the systematic review, the studies were analyzed by using the CASPe guide and Jadad scale. In the meta-analysis, the effect size of the studies was analyzed based on the results for pain and fear in children.

Results: A total of 25 studies were included in this systematic review; most of them had reported low methodological quality. The study sample cohorts ranged from a minimum of 14 participants to a maximum of 220 individuals. In the meta-analysis were included 10 studies. The global effect of using VR as a distraction measure had significantly reduced pain in children in the experimental groups (IV=-2.37, 95% CI [-3.20, -1.54]; Z=5.58; p<.001) and fear (IV=-1.26, 95% CI [-1.89, -0.63]; Z=3.92; p<.001)

Conclusions: The quality of the studies was mostly low. The main limitations are the impossibility of blind both the participants and healthcare personnel to the VR intervention. The use of VR as a distraction measure is effective in reducing pain and fear in children during procedures involving needles.

Trial Registration: The systematic review was registered with the Open Science Framework (Osf.io/cd8nr) in October, 2021.

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KEYWORDS

virtual reality; pain; fear; pediatric; needle; child; injection; VR; systematic review; meta-analysis; paediatric

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