



Virtual Reality Goggles for Pediatric Patients

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Introduction

Medical procedures can induce a lot of fear, pain and anxiety for patients, especially in the pediatric population. There are gaps in the management of children's reactions in medical settings.

Because of this, research has been continually searching for ways to improve pediatric experience. The use of virtual reality goggles is a relatively new intervention with the potential to have great outcomes in the medical world. Various studies have been done exploring how virtual reality could be used as a distraction technique impacting pain, fear, anxiety and overall experience of routine medical procedures in the pediatric population.



Children's Hospital Los Angeles. (n.d.). *Virtual reality in pediatrics* [Photograph]. Children's Hospital Los Angeles. <https://www.chla.org/virtual-reality-pediatrics>

Method

Ten articles from various places around the world exploring the effects of virtual reality goggles on the pediatric population were examined. To assess these effects, the studies utilized patient self-report in the form of different pain evaluation tools depending on age such as the FACES, APPT, FLACC, VAS, or simply a 0-10 pain scale rating. Anxiety and fear ratings were utilized as well and, in some instances, they assessed objective data such as vitals. In the qualitative studies, patient interviews describing their experience with virtual reality goggles as well as surveys were completed and evaluated. The overall goal was to see if virtual reality goggles had a positive, negative, or no impact on the pediatric patients' experience during invasive procedures in a medical setting.

Results

Despite the variety in the 10 research articles, the results remained the same. Our studies showed that virtual reality goggles are a useful, unharmed, non-pharmacological technique to improve pediatric experiences in healthcare. The goggles not only reduce pain, but also anxiety and fear, and increases patient satisfaction/experience.

- One specific randomized control study looking at the effects of virtual reality on pain, fear, and anxiety during blood draw in children aged 5-12 years old, found that pain scores were lower in the group using virtual reality during the blood draw than in the group using controlled distraction techniques. The fear and anxiety levels of the children in the control group were significantly higher than in the children using virtual reality (Ozalp et al., 2020).
- Another study done in 2018 exploring the effectiveness of virtual reality in minimizing stress and pain during venipuncture, found that pain intensity was lowered by 59% and stress was lowered by 73.4% (Piskorz & Czub, 2018).
- A systematic review study that looked into how virtual reality goggles affected pain in pediatric patients, explored virtual reality use during many different procedures including vaso occlusive pain episodes (VOE), inferior alveolar nerve block (IAN), immunization, pulp therapy, phlebotomy, dressing changes, burn wound care, IV placements, and venipunctures. This study found that virtual reality "showed a statistically significant reduction in pain" (Iannicelli et al., 2019).
- In an article about the use of virtual reality for patients with sickle cell disease, they also found virtual reality to be effective. They found that "The median pain intensity, number of affected body areas, and qualitative measures including sensory, affective, and evaluative, and temporal pain domains were statistically reduced" (Agrawal et al., 2018).
- For pediatrics experiencing procedures such as venous access, dental, burn, or oncological care, results of a study done in the Netherlands showed that virtual reality is effective in lowering pain and anxiety. They also came upon this result based on patient reported pain and anxiety, as well as observations of lower pain in the patients by the caregivers and medical professionals (Eijlers et al., 2019).
- Virtual reality can be used during immunizations as it was found in an article by Rudnick and colleagues that ratings of anticipated versus actual fear and pain due to immunizations improved following use of the headset in 94.1% of pediatric subjects (Rudnick et al., 2018).
- Virtual reality was yet again found to be successful in pediatric patients with a total pancreatectomy and auto transplant. This study found that all four people who tried or utilized virtual reality said it was fun, helpful, and not painful in immediate post-intervention assessments. They also said they would use virtual reality again and suggest it to others (Kucher et al., 2020).

Conclusion

After examining the research on the use of virtual reality goggles in the pediatric population, the findings were positive and showed promising results to help reduce pain and anxiety in a hospital setting. Implementation of virtual reality not only promotes holistic care, but is cost effective, and noninvasive. This form of therapy is not limited to pediatrics but could be incorporated in other age groups and settings. In the research articles reviewed, none brought up ethical issues, which is another benefit that the use of virtual reality has. Although the research done shows how effective virtual reality is, further research is warranted. The gaps would be; pain not being reassessed, no studies done on long term and repeated use, and the small sample sizes in studies show the need for further research. Virtual reality has a hopeful future and would be a great advancement in health care.

Future Directions

Virtual reality has been found to be a beneficial technology in many different ways, its use go beyond simply distractions and can actually change the way pain is processed. Children are more comfortable and open with technology due to the increasing use. In the subjects' that were studied, their discomfort, anxiety, and estimated time spent thinking about their suffering all decreased. This promises that the Spencer Hospital could strongly benefit from this form of therapy because it brings a positive approach to caring for patients. The process of this therapy may take time to set up all the logistics but once it is implemented, results will be seen immediately with the patients. *this research was done in partnership with Spencer Hospital

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