

# NUTRITION & PEDIATRICS 2019: Effectiveness of immersive virtual reality therapy on pain and anxiety among children undergoes painful procedures in UMAID hospital - S K Mohanasundari - All India Institute of Medical Sciences- Jodhpur, India

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## Abstract

**Introduction:** Virtual reality (VR) is a computer technology that creates an artificial 3-dimensional simulated environment. Virtual reality consists of a head-mounted display and a thick pair of goggles that are connected to either a computer or a cell phone. Although originally designed for entertainment purposes, the potential use of VR in the medical field has recently been explored. Experimental trials using VR in therapy for anxiety or posttraumatic stress disorder and for coping with pain demonstrate potential for this technology.

Distraction is a typical non-pharmacologic method utilized by medicinal services experts to oversee and constrict uneasiness, and perhaps torment, during excruciating strategies in Pediatric patients. Both passive distraction (e.g., staring at the TV, tuning in to a book) and active distraction (e.g., intuitive toys, electronic games) have been broadly contemplated and cause an abatement in agony and nervousness. Computer generated reality may offer much more interruption, as it totally drenches the patient in a different universe and includes numerous faculties.

Pain is a complex experience comprising sensory, cognitive, behavioural, and psychological components. Excruciating systems, for example, immunizations, intravenous infusions, cut fixes, and dressing changes for consume wounds are a typical piece of pediatric clinical treatments.<sup>3</sup> Painful circumstances during these methodology regularly lead to uneasiness for patients, which can cause dread and significantly influence consistence with care for future techniques. Further, conditions causing interminable torment, for example, sickle cell infection, may likewise effectsly affect the lives of children

Common pediatric pharmacologic analgesia includes opioid therapy, which is known to have high tolerance and dependence.<sup>4</sup> Opioids also have an unfavourable safety profile in children, with side effects ranging from nausea and constipation to cognitive impairment and respiratory depression.

Distraction is a typical nonpharmacologic strategy utilized by human health care professionals to manage and attenuate anxiety, and perhaps pain, during agonizing strategies in pediatric patients.<sup>6</sup> Both inactive interruption (eg, sitting in front of the TV, tuning in to a book) and dynamic interruption (eg, intuitive toys, electronic games) have been widely contemplated and cause a diminishing in torment and

anxiety.<sup>6</sup> Virtual reality may offer considerably more interruption, as it totally drenches the patient in a different universe and includes various senses.<sup>7</sup> Patients can effectively or latently take part in various potential projects

**How VR affects pain:** The hypothesis behind VR's job in lessening torment and not just nervousness is identified with the constrained attentional limit people have. Agony requires consideration, and if a portion of that consideration can be redirected (eg, by interfacing with VR), the patient will have a more slow reaction to approaching torment signals.<sup>8</sup> Pain is distinguished by nociceptors situated all through the body that transfer torment signs to the focal sensory system by means of A- $\delta$  filaments and C-fibres.<sup>15</sup> Many analgesics work by intruding on the C-fiber pathway, therefore upsetting the manner in which people sense torment. Computer generated reality doesn't interfere with the agony flags yet acts both legitimately and in a roundabout way on torment observation and motioning through consideration, feeling, fixation, memory, and different faculties.

An examination utilizing utilitarian attractive reverberation imaging of sound patients who were utilizing VR while presented to an agonizing improvement (warm torment trigger on the foot) demonstrated a more noteworthy than half decrease in torment related mind movement in 5 regions of the brain.<sup>16</sup> An investigation of 9 subjects, matured 20 to 38, contrasted VR reproduction with narcotic analgesics during warm torment incitement, and results were estimated with abstract torment reports and practical attractive reverberation imaging.<sup>9</sup> Virtual reality and narcotic analgesics had entirely equivalent outcomes regarding torment decrease, and it was discovered that the mix of narcotics with VR brought about huge further decrease in torment signals ( $P < .01$ ).

**Method:** This study is conducted to assess the effectiveness of immersive virtual reality therapy on pain and anxiety among 60 children aged between 3 years to 12 years undergoing various painful procedures in UMAID Hospital, Jodhpur, India. Post-test only designs were adopted. The invasive procedure includes collecting blood samples, venipuncture, IM injection and SC injections. Ethical permission was obtained from institutional ethical committee and informed consent was obtained from children above 7 years and from parents of children below 7 years. Randomly children were assigned to control group and experimental group; 30 in each group. The children in control group received standard care (toys and verbal distraction, etc.) during invasive procedure and they were assessed for pain and anxiety level after 60 seconds of procedure by using numerical visual pain scale and Wong Baker facial expression scale.

Children in the experimental group given head-mounted virtual reality display connected to smart phone (played 3D video) during invasive procedures and allowed to play the video for 5 minutes before the procedure and until 60 seconds after the procedure. The child pain and anxiety was observed during the time of procedure through Wong Baker pain scale and after the procedure children were asked to describe the level of pain and anxiety through numerical visual pain and anxiety scale for further validation.

**Result:** The result indicated that children in the trial bunch experienced less torment and uneasiness than the children in the control group. There is sure relationship exists among pain and anxiety level. The age and sort of technique has huge relationship with level of pain. The age, sex and sort of strategy had huge relationship with level of anxiety

**Conclusion:** VR interruption seems, by all accounts, to be effective for children with the pain during intrusive system. VR is thought to diminish pain and tension by coordinating kids' consideration into the virtual world, leaving less consideration accessible to process approaching neural signs from torment receptors. This arrangement can be effectively applied by attendants in their clinical practice.