PMSIG Research: Abstracts, Articles and Reviews

We are looking for members to join our Research Committee for the Pain Management Special Interest Group. This is an expansion of our leadership to help promote new ideas and interest in research related to pain. If interested in joining this committee, please contact me at dana-dailey@uiowa.edu.

Every other month, the Pain Management Special Interest Group provides updates on new topics, new information and research related topics. Please feel free to submit a topic or research question to dana-dailey@uiowa.edu. If you would like to help in preparing the information, please let me know as well.

March 2018 Topic: Virtual Reality in Pain Management

Multidisciplinary Tool in Clinical Medicine: Pourmond A (2017)[3]
Pain Reduction: Gupta A (2018) [1]
Pain Management in Burns, Systematic Review: Scapin S (2018) [4]
Intervention During Medical Procedures: Indovina P (2018) [2]

Bibliography

1. Gupta Ap, Scott Kp, Dukewich Mp. Innovative Technology Using Virtual Reality in the Treatment of Pain: Does It\par Reduce Pain via Distraction, or Is There More to It?\par. *Pain medicine (Malden, Mass.)\par.* 19\par:151-159\par, 2018

2. Indovina Pp, Barone Dp, Gallo Lp, Chirico Ap, De Pietro Gp, Antonio Gp. Virtual Reality as a Distraction Intervention to Relieve Pain and Distress During\par Medical Procedures: A Comprehensive Literature Review.\par. *The Clinical journal of pain\par.* 2018

3. Pourmand Ap, Davis Sp, Lee Dp, Barber Sp, Sikka Np. Emerging Utility of Virtual Reality as a Multidisciplinary Tool in Clinical\par Medicine.\par. *Games for health journal\par.* 6\par:263-270\par, 2017

4. Scapin Sp, Echevarria-Guanilo MEp, Boeira Fuculo Junior PRp, Goncalves Np, Rocha PKp, Coimbra Rp. Virtual Reality in the treatment of burn patients: A systematic review.\par. *Burns : journal of the International Society for Burn Injuries\par.* 2018

Emerging Utility of Virtual Reality as a Multidisciplinary Tool in Clinical Medicine.
Pourmand A, Davis S, Lee D, Barber S, Sikka N.

Abstract

Objective:
Among the more recent products borne of the evolution of digital technology, virtual reality (VR) is gaining a foothold in clinical medicine as an adjunct to traditional therapies. Early studies suggest a growing role for VR applications in pain management, clinical skills training, cognitive assessment and cognitive therapy, and physical rehabilitation.

Materials and Methods:

To complete a review of the literature, we searched PubMed and MEDLINE databases with the following search terms: "virtual reality," "procedural medicine," "oncology," "physical therapy," and "burn." We further limited our search to publications in the English language. Boolean operators were used to combine search terms.

Results:
The included search terms yielded 97 potential articles, of which 45 were identified as meeting study criteria, and are included in this review. These articles provide data, which strongly support the hypothesis that VR simulations can enhance pain management (by reducing patient perception of pain and anxiety), can augment clinical training curricula and physical rehabilitation protocols (through immersive audiovisual environments), and can improve clinical assessment of cognitive function (through improved ecological validity).

Conclusion:
Through computer-generated, life-like digital landscapes, VR stands to change the current approach to pain management, medical training, neurocognitive diagnosis, and physical rehabilitation. Additional studies are needed to help define best practices in VR utilization, and to explore new therapeutic uses for VR in clinical practice.
PMID:28759254

Innovative Technology Using Virtual Reality in the Treatment of Pain: Does It Reduce Pain via Distraction, or Is There More to It?

Gupta A, Scott K, Dukewich M~~Anita Gupta, DO, PharmD, Kevin Scott, BS, and Matthew Dukewich, PharmD~~

Abstract
Objective:

Virtual reality (VR) is an exciting new technology with almost endless possible uses in medicine. One area it has shown promise is pain management. This selective review focused on studies that gave evidence to the distraction or nondistraction mechanisms by which VR leads to the treatment of pain.

Methods:
The review looked at articles from 2000 to July 29, 2016, focusing on studies concerning mechanisms by which virtual reality can augment pain relief. The data was collected through a search of MEDLINE and Web of Science using the key words of "virtual reality" and "pain" or "distraction."

Results:
Six studies were identified: four small randomized controlled studies and two prospective/pilot studies. The search results provided evidence that distraction is a technique by which VR can have benefits in the treatment of pain. Both adult and pediatric populations were included in these studies. In addition to acute pain, several studies looked at chronic pain states such as headaches or fibromyalgia. These studies also combined VR with other treatment modalities such as biofeedback mechanisms and cognitive behavioral therapy.

Conclusions:
These results demonstrate that in addition to distraction, there are novel mechanisms for VR treatment in pain, such as producing neurophysiologic changes related to conditioning and exposure therapies. If these new mechanisms can lead to new treatment options for patients

with chronic pain, VR may have the ability to help reduce opioid use and misuse among chronic pain patients. More studies are needed to reproduce results from prospective/pilot studies in large randomized control studies.
PMID:29025113

Virtual Reality in the treatment of burn patients: A systematic review.
Scapin S, Echevarría-Guanilo ME, Boeira Fuculo Junior PR, Gonçalves N, Rocha PK, Coimbra R.

Abstract

Aim:
To identify studies that approach immersive virtual realities and its main effects in the treatment of burn patients in the context of the scientific world of literature.

Methods:
A systematic review following the steps of Cochrane. The search was conducted in eight databases between May and August 2016.

Results:
34 studies were analyzed, including 23 randomized clinical trials. VR was applied using three-dimensional features and video games. The findings demonstrate the association of this technology with increased enjoyment and the reduction of pain, anxiety and stress during dressing changes and also during physical rehabilitation and physiotherapy. Few side effects have been reported.

Conclusion:
VR is a complementary drug strategy that has proven beneficial results in the treatment of burn patients.

PMID: 29395400

Virtual reality as a distraction intervention to relieve pain and distress during medical procedures: a comprehensive literature review
~~Paola Indovina, PhD, Daniela Barone, PhD, Luigi Gallo, PhD, Andrea Chirico, PhD, Giuseppe De Pietro, MD, Antonio Giordano MD, PhD~~ Indovina P, Barone D, Gallo L, Chirico A, De Pietro G, Antonio G

Abstract

Objectives:
This review aims to provide a framework for evaluating the utility of virtual reality (VR) as a distraction intervention to alleviate pain and distress during medical procedures. We firstly describe the theoretical bases underlying the VR analgesic and anxiolytic effects and define the main factors contributing to its efficacy, which largely emerged from studies on healthy volunteers. Then, we provide a comprehensive overview of the clinical trials using VR distraction during different medical procedures, such as burn injury treatments, chemotherapy, surgery, dental treatment, and other diagnostic and therapeutic procedures.

Methods:
A broad literature search was performed using as main terms "virtual reality", "distraction" and "pain". No date limit was applied and all the retrieved studies on immersive VR distraction during medical procedures were selected.

Results:
VR has proven to be effective in reducing procedural pain, as almost invariably observed even in patients subjected to extremely painful procedures, such as patients with burn injuries undergoing wound care and physical therapy. Moreover, VR seemed to decrease cancer-related symptoms in different settings, including during chemotherapy. Only mild and infrequent side effects were observed.

Discussion:
Despite these promising results, future long-term randomized controlled trials with larger sample sizes and evaluating not only self-report measures but also physiological variables are needed. Further studies are also required both to establish predictive factors to select patients who can benefit from VR distraction and to design hardware/software systems tailored to the specific needs of different patients and able to provide the greatest distraction at the lowest cost.

PMID:29485536