

## Abstract

**Title:** Using Virtual Reality as a Therapeutic Modality for Children with Cerebral Palsy: a Review and Synthesis

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**Background:** Cerebral palsy is often referred to as an “umbrella term” denoting a group of non-progressive conditions involving primarily a disorder of voluntary movement and/or co-ordination. A functional impairment is more important than diagnosis itself, due to the lifelong type of the disease. Therapy in children suffering from CP is nowadays based on individual movement therapy within a whole complex of rehabilitation programmes. The first line of treatment is building up an interdisciplinary team of professionals, led by paediatrics neurologist or neurologist who is pursuing rehabilitation.

Physical therapist should always choose an eclectic approach, knowing only too well the reasons why. Virtual reality as a therapeutic modality is standing besides classic methods according to various authors, as we know from schools and different courses. However, this kind of treatment is novel, its results are greatly promising based on current research.

**Aim:** The purpose of this thesis is to outline the use of virtual reality as a method of therapy in children with cerebral palsy in the main functional conditions – motor control, upper extremity dysfunction and balance. The intention is not to give a preference to this kind of treatment, but to highlight it as a possibility and a path for further procedures.

**Method:** This thesis is a literature review, reviewing journals, articles and books collected from the period of one year (spring 2013 to spring 2014) The collected sources are from databases (PubMed MEDLINE and CINAHL used for comparison). Other databases used as additional sources are PEDro, Academic Search Complete, Embase, ProQuest, and Cochrane. The relevant journals and reviewed books were considered.

**Results:** After data extraction based on the exclusion criteria, the search resulted in a total of 27 articles (in Pubmed and Cinahl), including 2 reviews. Most of the articles were pilot studies with a small sample of participants, some of them were case studies.

The results were divided into three categories according to the method of therapeutic use of virtual reality intervention: motor control and overall motor performance, upper extremity dysfunction, and balance impairment. Most of the studies found and selected from the compared databases (Pubmed and Cinahl) evaluated the feasibility of virtual reality (VR) on upper extremity function, fewer of them the effect on balance function and motor control.

**Conclusion:** The amount of studies found is, however, very small. Few of them are novel and unusual, evaluating the customary technology focused primarily on the key functional problem, but usually at the preliminary phase of research. Most of the studies found are quite inconsistent in their methods of measurement and aim. If the criteria "adults" or "adolescents" were included, the number of results would be larger, due to a lot of articles on the usefulness of VR intervention in stroke patients. Nevertheless, in my opinion, further research is needed, focused predominantly on children's requirements and psychology combined with usefulness for functional physical impairments using custom-made games.

**Keywords:** computer-simulated environment, cerebral palsy, gaming systems, rehabilitation