

## Summary

**Title:** Modern technologies used in physiotherapy at children with cerebral palsy

**Objectives:** The goal of this diploma thesis is evaluate the effect of robotic and virtual therapy on motor functions of lower limbs at children with cerebral palsy. Furthermore, the work is focused on summarizing current knowledge about cerebral palsy, robotic and virtual technologies.

**Methods:** The diploma thesis is processed as a literature review from available literary resources. First part of thesis contains all theoretical bases and knowledge's about cerebral palsy, robotic and virtual technologies use in physiotherapy lower limbs at children with this diagnosis. Second part has a descriptive – analytical character and contains analysis of studies, which was used treatment with robotic and virtual technologies. The thesis is concluded with a discussion, which focused mainly on three basic research questions of the diploma thesis.

**Results:** A total of 8 randomized controlled trials that met the criteria for inclusion in this thesis were described. When making recommendations for using robotics and virtual technologies, is necessary to take into account the type of cerebral palsy, the degree of disability according to GMFCS, age, motor deficit and individual abilities and goals of the therapy. Studies show that the most optimal is the use of robotic technologies for 4 weeks, with frequency of 5 therapies per week. The duration of one intervention is 40 minutes. On the other hand, in virtual technologies, the optimal total duration of therapy is 8 weeks, with a frequency of 2 – 3 interventions per week. The length of one therapy varies from 30 to 45 minutes. According to the studies in the research, the age group that the have most benefits from robotic therapy varies from 6 to 8 years, and in virtual therapy the range is between 10 and 11 years.

The most commonly used robotic technology is currently the Lokomat device. For virtual therapy, are most applied commercialized games consoles, such as Nintendo Wii, Xbox 360 and Playstation Eye Toy. In select studies is the most appeared device Nintendo Wii.

**Keywords:** cerebral palsy, virtual reality, robotic therapy, robotic technology, robotic rehabilitation, virtual therapy, videogames