VIRTUAL REALITIES AS MOTIVATIONAL TOOLS FOR ROBOTIC ASSISTED GAIT TRAINING IN CHILDREN: A SURFACE ELECTROMYOGRAPHY STUDY.

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ABSTRACT

Patient's active cooperation is essential to achieve good outcome in pediatric rehabilitation. Therefore, virtual environments were developed to enhance robotic assisted gait training. The purpose of this study was to evaluate virtual realities as motivational tools during robotic assisted gait training with children in the pediatric Lokomat®. Nine children with different gait disorders and eight healthy children participated in the study. Muscular effort of the lower leg was assessed by surface electromyography during a randomly designed training protocol with virtual realities. Self reported motivation was investigated with two questionnaires. Comparisons were drawn through repeated measurement Analysis of Variance and paired-t-tests. The logarithmic transformed data showed that the electromyographic activity output in both groups was significantly higher during tasks with virtual realities than during normal walking conditions. These results support that virtual realities seem to be efficient motivational tools to increase children's muscular effort in the pediatric Lokomat®. The gaming aspect of virtual realities keeps children highly engaged during repetitive tasks.