ENABLE

EvaluatioN of motor cApacities and telerehaBilitation in chiLdren with neuromotor disordErs

ABSTRACT

Neurological diseases in childhood, such as cerebral palsy and neuromuscular disorders, often cause significant motor impairments, deeply affecting children's quality of life. Preserving or restoring mobility and providing accurate functional diagnoses are urgent priorities to guide clinical decisions. Functional assessments, i.e. grasping or walking tasks, are currently conducted in standardised healthcare settings according to the 'International Classification of Functioning', focusing on individual capability or capacity. However, these assessments i) often overlook the individual functional mobility in their daily environment while it is known to substantially influence motor behaviour and ii) are very timely and costly (system acquisition, personnel and training) and therefore sparse. Nonetheless, conducting longitudinal assessments of children's functional disabilities remain crucial as growth and maturation significantly influence motor capacities and performances over time.

The ENABLE project is initiated with the dual purpose of i) regularly investigating and assessing the capabilities and performances in children with neuromotor disorders in their daily environment, and ii) reeducating their functional disabilities caused by these disorders. The cornerstone of this initiative is a user-friendly mobile application designed specifically for the evaluation and telerehabilitation of motion in children (developed in collaboration with MoveAhead). This innovative tool will be implemented with AI assistance and will allow parents and practitioners to conduct motor behaviour assessments directly at home using their smart devices, significantly increasing the frequency of evaluations. This will allow to comprehensively explore the impact of neurological diseases on movement, connecting specific outcomes such as motor signatures to pathologies, and study how these impact various movements in daily life. The children's motor signatures will also serve as valuable markers to monitor the effectiveness of rehabilitation. Overall, the tool developed in the ENABLE project will allow for personalised, intelligent and adaptive telerehabilitation programs for children with neuromotor disorders.

This project holds significant promise as a simplified and cost-effective tool to address functional motor disabilities with greater frequency and accessibility. Its potential integration into both clinical practice and home settings empowers parents to participate actively in their children's care. Evaluating motor performance in daily living contexts enhances assessment processes and promotes more frequent monitoring of children's motor abilities.

For physiotherapists and physicians, this solution will streamline the identification of neurological diseases through motor signatures, facilitating accurate recognition, diagnosis and monitoring. Furthermore, this application enables remote supervision by quantifying relevant outcomes, allowing for ongoing progress monitoring and feedback. It also facilitates personalised home-based rehabilitation programs, reducing the need for frequent clinic visits and increasing accessibility to rehabilitation for children with neuromotor disorders.

KEYWORDS

- Neuromotor disorders
- Capability
- Motion Analysis
- Performance
- Rehabilitation

DURATION

36 months

PARTNERS

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