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Article Overview:

This systematic review offered a snapshot of the existing literature on robotic systems for the rehabilitation of gait and balance in children with neurological disabilities.

The review included 31 articles, mostly involving children with cerebral palsy.

Sample: children (age < 18 years old) affected by neurological diseases.

Key take home messages:

1. A limited number of studies on this topic were found. Methodological quality was low to moderate.
2. There were limited number of devices developed for the paediatric population, whereby most were initially intended for adult users. However, several studies have shown that their use can offer relevant opportunities to promote children's sensorimotor recovery and prevent disease progression.
3. There is an identified need for new devices specifically designed and developed for children. It would be essential to involve both engineers and therapists during the design stage.
4. Findings suggested that rehabilitation protocols are highly heterogeneous in terms of treatment duration, ranging from one to 60 sessions and duration of each session ranging from eight to 75 mins. In a limited number of studies, the difficulty level of the treatment was adjustable to the patient's needs.
5. Robot-assisted rehabilitation may be helpful and feasible for neurorehabilitation in children. When using robotic devices, clinicians should design intensive, task-oriented, personalized treatment to foster neuroplasticity and recovery.