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Scoping Review: Possible Role of Artificial Intelligence on Cognitive Improvement of Children with Cerebral Palsy

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Introduction:

Cerebral palsy is a neurological disorder that affects movement, muscle tone, and motor skills in children. However, it can also affect cognitive development, leading to learning and memory difficulties. With the rapid advancement of artificial intelligence (AI), researchers have started exploring its potential in improving the cognitive function of children with cerebral palsy. This scoping review aims to investigate the possible role of AI on the cognitive improvement of children with cerebral palsy. By exploring the available literature on this topic, this study intends to shed light on the ways in which AI could potentially positively impact the cognitive development of children with cerebral palsy, ultimately contributing to the development of effective interventions.

Methods:

The authors conducted a scoping review to explore the potential of artificial intelligence (AI) in enhancing the cognitive development of children with cerebral palsy. We conducted a comprehensive literature search using multiple electronic databases, including PubMed, Scopus, Embase, ScienceDirect, Cochrane Database, and Google Scholar. The search was restricted to studies published between 2015 and 2022 and included using related articles feature to expand the search. The keywords "artificial intelligence," "cerebral palsy," and "cognitive development" were used to identify relevant studies. The authors used a scoping review method to map the existing literature and identify research gaps.

Results:

The scoping review found 69 studies on the potential impact of artificial intelligence on the cognitive development of children with cerebral palsy. 22 (31.9%) of these studies were experimental, 25 (36.2%) were observational, and 22 (31.9%) were review studies.

The studies looked at how different AI techniques, such as machine learning algorithms, virtual reality, and robotics, could help children with cerebral palsy improve their cognitive abilities. According to the findings, AI has the potential to improve the cognitive development of children with cerebral palsy in a variety of domains, including attention, memory, language, and executive functioning.

Machine learning algorithms have been shown to be effective in predicting cognitive abilities in children with cerebral palsy, allowing for early intervention and personalized treatment plans. It has been demonstrated that virtual reality improves cognitive skills such as spatial awareness, visual attention, and motor planning. Interventions based on robotics have been shown to improve attention, memory, and executive functioning.

The scoping review also identified several barriers to AI adoption in the field of cerebral palsy, such as a lack of technology and expertise, a lack of standardization, and ethical concerns.

Conclusion:

The results of this study suggest that AI has the potential to play a significant role in the cognitive improvement of children with CP. However, further research is needed to fully understand the impact of AI on cognitive development in this population and to develop effective AI-based interventions.

Keywords:
artificial intelligence, cerebral palsy, cognitive development