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Editorial

Technology for healthcare professionals' education about the early detection of cerebral palsy

Efforts to implement early detection policies for Cerebral Palsy (CP) have gained momentum globally, recognizing CP as a leading cause of physical disability across high-, middle-, and low-income countries. A milestone in this process was the publication of a framework for early detection of CP in 2017.[1] This framework recommends combining magnetic resonance imaging, Prechtl Qualitative Assessment of General Movements (GMs), and the Hammersmith Infant Neurological Examination for babies with risk factors, achieving high accuracy and detection rates exceeding 97 %.[1]

Late CP diagnosis has been linked to limited functional outcomes, reduced social participation, higher caregiver dissatisfaction, delayed interventions, and secondary complications, such as developmental delays and orthopedic issues like hip dislocation.[1] Early detection, on the other hand, unlocks opportunities for interventions during critical neuroplasticity periods of the brain, potentially improving developmental outcomes for children and their families.[2] Parents overwhelmingly express a desire to know about CP diagnoses as early as possible.

Several high-risk infant follow-up clinics in countries like the United States and Australia have integrated the 2017 framework into clinical practice.[3,4] These implementations have shown promising results, including good feasibility of the guide, increased screening for infants aged 3–4 months, reduced CP diagnosis age, improved staff awareness, and high acceptability among parents and professionals.[3,4] Additionally, early identification has facilitated access to tailored interventions.[4] However, this framework remains underutilized globally, with implementation predominantly limited to high-income countries (HICs).[5]

In low- and middle-income countries (LMICs), where CP prevalence is higher and clinical presentations more severe,[6] early detection frameworks face barriers such as limited resources, structural healthcare differences, and high costs.[5] For instance, in Brazil, although many therapists are aware of the framework's tools, most do not apply them in practice.[7]

Inclusive strategies are essential to make the framework accessible worldwide. The use of technology can be an effective tool in the early detection of CP. Technology emerges as a powerful ally, serving both educational[8] and clinical decision-making processes.[9] Digital health technologies, including serious games, virtual and augmented reality, and mobile health (mHealth) applications, can bridge the gap.[9] mHealth, defined as healthcare practice through mobile devices, is expanding rapidly and demonstrates good feasibility in LMICs.[10]

In CP-specific contexts, an app leveraging deep learning to analyze infant general movements has proven as accurate as trained professionals in classifying movements, showcasing technology's potential in clinical decision-making.[11] Furthermore, serious games have successfully enhanced healthcare education,[12] boosting knowledge, decision-making skills, and collaboration in safe, simulated environments.[13] Additionally, the use of mHealth has been applied and tested in various healthcare contexts, such as maternal and child health, and can be a useful tool to assist clinical diagnosis.[14]

With over five billion smartphone users worldwide, 70 % in low-resource settings, mobile apps are affordable, accessible, and effective tools for healthcare providers.[15] These technologies can support early CP detection, improving outcomes by empowering professionals with knowledge and diagnostic support. Future research should prioritize developing mobile applications tailored to educating healthcare professionals and aiding clinical decision-making for CP detection, ensuring equitable access to early diagnosis worldwide. Fig. 1 outlines several actions that require further improvement to effectively implement this technology for aiding health professionals in the early detection of CP on a larger scale, particularly in low- and middle-income countries.

Declaration of competing interest

The authors declare no conflict of interest.

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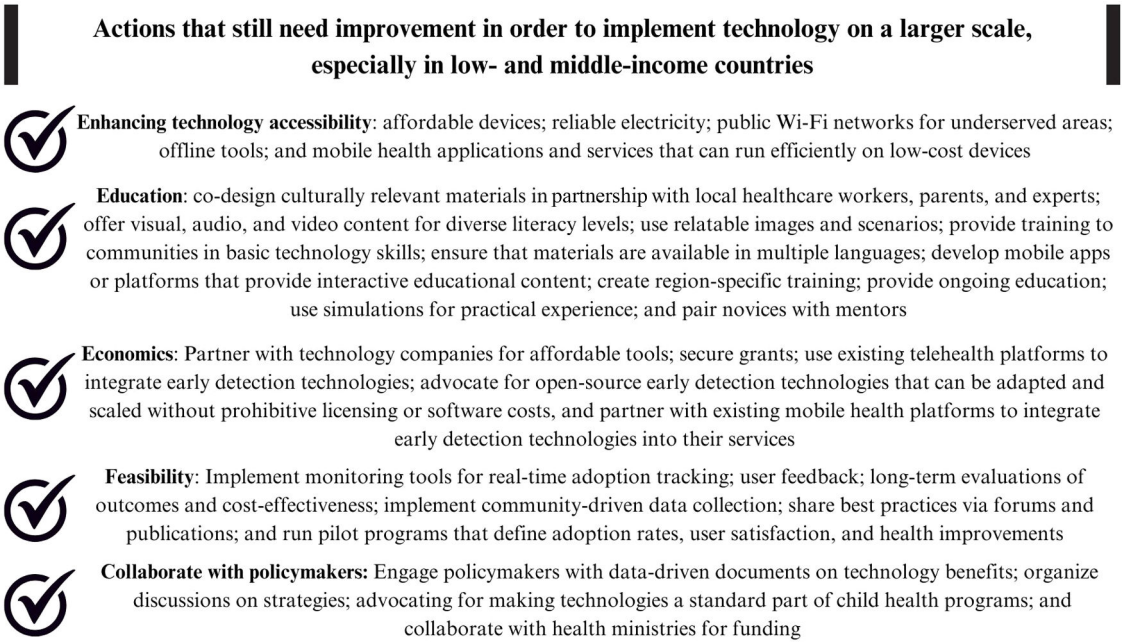

Fig. 1. Suggested actions to improve the implementation of technology for the early detection of cerebral palsy.

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