

BECOME: longitudinal impact of the COVID-19 pandemic on cognitive, emotional, and behavioral development in children and adolescents

Friday, September 12, 2025 5:50 PM (10 minutes)

Introduction: The COVID-19 pandemic has raised critical concerns about its potential impact on children's cognitive, emotional, and behavioral development. The BECOME project (Behavioral, Emotional, and Cognitive Observations with Generator Real World Data) aimed to investigate developmental trajectories from childhood to adolescence using real-world psychometric data. The study primarily sought to identify developmental changes and potential early indicators of psychological distress, particularly in relation to the COVID-19 period.

Methods: A retrospective observational study included 787 patients aged 6-18 years who underwent cognitive academic, and emotional-behavioral assessments between 2019 and 2023 at the Fondazione IRCCS Policlinico Universitario A. Gemelli. A total of 2661 evaluations were processed using the Generator Real World Data platform, enabling automated extraction and AI-driven semantic classification of psychometric data. Standardized tools were used at multiple time points, and patients were categorized according to the timing of evaluations relative to the pandemic (pre-, during-, and post-COVID).

Results: Statistically significant declines in Verbal Comprehension ($p = .002$) and Perceptual Reasoning ($p < .001$) were observed between pre- and post-COVID assessments, with the most pronounced deterioration in the Cross-COVID group. The Working Memory showed a moderate decrease, while Processing Speed remained stable across groups ($p = .88$). No persistent cognitive decline was observed beyond two years post-pandemic.

Conclusions: COVID-19 had a measurable short-term impact, with signs of recovery over time. AI-driven semantic profiling of big data enabled early detection of subtle cognitive changes. These results highlight the potential of real-world data and AI for early risk identification and personalized interventions.

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No

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