

Table SI. Full database search strings used in the literature search (January 2020-June 2025).

Database	Search string
PubMed	((('COVID-19'[Mesh] OR 'COVID-19' OR 'SARS-CoV-2' OR coronavirus OR pandemic) AND (infant* OR toddler* OR preschool* OR 'early childhood' OR 'young children' OR '0-5 years') AND (neurodevelopment OR 'developmental outcomes' OR socioemotional OR 'emotional problems' OR 'behavioral problems' OR 'cognitive development' OR 'language development' OR 'executive function' OR temperament) AND ('caregiver stress' OR 'parental stress' OR 'parental mental health' OR 'maternal mental health' OR 'home learning environment' OR 'early learning' OR ECEC OR stimulation OR routines)) AND ('2020/01/01'[Date - Publication] : '2025/06/30'[Date - Publication]))
Embase	('covid-19'/exp OR 'covid-19' OR 'sars-cov-2' OR coronavirus OR pandemic) AND (infant*:ab,ti OR toddler*:ab,ti OR preschool*:ab,ti OR 'early childhood':ab,ti OR 'young children':ab,ti OR '0-5 years':ab,ti) AND (neurodevelopment:ab,ti OR 'developmental outcomes':ab,ti OR socioemotional:ab,ti OR 'emotional problems':ab,ti OR 'behavioral problems':ab,ti OR 'cognitive development':ab,ti OR 'language development':ab,ti OR 'executive function':ab,ti OR temperament:ab,ti) AND ('caregiver stress':ab,ti OR 'parental stress':ab,ti OR 'parental mental health':ab,ti OR 'maternal mental health':ab,ti OR 'home learning environment':ab,ti OR 'early learning':ab,ti OR ECEC:ab,ti OR stimulation:ab,ti OR routines:ab,ti) AND ([2020-01-01]/py : [2025-06-30]/py)
PsycINFO	(DE 'COVID-19' OR 'COVID-19' OR 'SARS-CoV-2' OR coronavirus OR pandemic) AND (infant* OR toddler* OR preschool* OR 'early childhood' OR 'young children' OR '0-5 years') AND (neurodevelopment OR 'developmental outcomes' OR socioemotional OR 'emotional problems' OR 'behavior problems' OR 'cognitive development' OR 'language development' OR 'executive function' OR temperament) AND ('caregiver stress' OR 'parental stress' OR 'parental mental health' OR 'maternal mental health' OR 'home learning environment' OR 'early learning' OR ECEC OR stimulation OR routines) AND (PY >= 2020 AND PY <= 2025)
Web of Science	TS=((('COVID-19' OR 'SARS-CoV-2' OR coronavirus OR pandemic) AND (infant* OR toddler* OR preschool* OR 'early childhood' OR 'young children' OR '0-5 years') AND (neurodevelopment OR 'developmental outcomes' OR socioemotional OR 'emotional problems' OR 'behavioral problems' OR 'cognitive development' OR 'language development' OR 'executive function' OR temperament) AND ('caregiver stress' OR 'parental stress' OR 'parental mental health' OR 'maternal mental health' OR 'home learning environment' OR 'early learning' OR ECEC OR stimulation OR routines)) AND PY=(2020-2025)

Searches were conducted in PubMed (<https://pubmed.ncbi.nlm.nih.gov/>), Embase (<https://www.embase.com/>), PsycINFO (<https://psycnet.apa.org/>) and Web of Science (<https://www.webofscience.com/>) using combinations of COVID-19, early childhood (0-5 years), developmental outcomes, caregiving context and biological markers. COVID-19, 2019 coronavirus disease; SARS-CoV-2; severe acute respiratory syndrome coronavirus 2; ECEC, early childhood education and care.

Table SII. Quality appraisal criteria for narrative review evidence.

Quality level	Criteria
High quality	Large or well-designed longitudinal or cohort studies; prospective data collection (pre-pandemic comparison groups when relevant); validated, developmentally appropriate outcome measures (such as ASQ-3, CBCL and BSID); strong analytic rigor (adjustment for SES, parental mental health and transparent handling of attrition); clear exposure definition (such as timing of prenatal exposure and ECEC disruption); representative or diverse samples supporting generalizability.
Moderate quality	Adequate sample sizes but a small number of limitations (such as convenience sampling or limited diversity); cross-sectional or short-term longitudinal designs; validated measures but often single-informant caregiver report; partial adjustment for confounders; a number of design constraints (such as no pre-pandemic comparison group or limited follow-up).
Low or preliminary quality	Small or highly selective samples; pilot or exploratory designs; limited measurement rigor (non-validated tools and heterogeneous biomarker assays); minimal control for confounding; unclear exposure definitions or retrospective reporting; short follow-up or single time-point assessments.

ASQ-3, Ages and Stages Questionnaire-3; ECEC, early childhood education and care; SES, socioeconomic status; CBCL, Child Behavior Checklist; BSID, Bayley Scales of Infant Development.