Review Article

Implementation research in the area of early childhood: scoping review

Pesquisas de implementação na área da primeira infância: revisão de escopo

Estudio de implementación en el área de la primera infancia: revisión de alcance

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Abstract

Objective: To systematically map implementation research focusing on interventions aimed at early childhood development, its main characteristics and implementation strategies.

Methods: A scoping review of the global literature was planned and performed in accordance with recommendations of the Joanna Briggs Institute. The search was carried out in nine electronic databases (PubMed, Scopus, Embase, Health System Evidence, Social Systems Evidence, Cochrane, ERIC and CINHAL and VHL) from the beginning of indexing until August 2021.

Results: The searches mapped 4,105 references, 2,805 of which were unrepeated. After screening, 211 studies were read in full and 82 included. The health sector was the most frequent in interventions, followed by education and social services. Programs aimed at childhood development and strategies focused on parenting, family and nutrition were the main interventions. In total, 89.0% presented children as direct beneficiaries of the strategies. The average duration of interventions was 14.5 months and 25.6% of studies based their methodology on frameworks to analyze the implementation of interventions. Half analyzed adaptations of interventions or programs, while 29.3% cited equity aspects of implementation.

Conclusion: This scoping review allowed the analysis of a set of interventions aimed at early childhood, demonstrating the potential of implementation research on early childhood development programs, identifying more appropriate strategies to the contexts and the reach of intended objectives, based on incorporation of implementation outcomes.

Resumo

Objetivo: Mapear sistematicamente as pesquisas de implementação com foco em intervenções voltadas ao desenvolvimento na primeira infância, suas principais características e estratégias de implementação.

Métodos: Uma revisão de escopo da literatura global foi planejada e executada conforme as recomendações do Instituto Joanna Briggs. A busca foi realizada em nove bases eletrônicas (PubMed, Scopus, Embase, Health System Evidence, Social Systems Evidence, Cochrane, ERIC e CINHAL e BVS), do início da indexação até agosto de 2021.

Resultados: As buscas mapearam 4.105 referências, sendo 2.805 únicas. Após triagem, 211 estudos foram lidos na íntegra e 82 incluídos. O setor saúde foi o mais frequente nas intervenções, seguido da educação e serviço social. Programas voltados ao desenvolvimento infantil e estratégias focadas na parentalidade, família, nutrição, foram principais intervenções. No total, 89,0% apresentaram as crianças como beneficiárias

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diretas das estratégias. A duração média das intervenções foi de 14,5 meses e 25,6% dos estudos fundamentaram sua metodologia em frameworks para analisar a implementação das intervenções. A metade analisou adaptações das intervenções ou programas, enquanto 29,3% citaram aspectos de equidade da implementação.

Conclusão: Esta revisão de escopo permitiu a análise de um conjunto de intervenções voltadas à primeira infância, demonstrando o potencial das pesquisas de implementação de programas de desenvolvimento da primeira infância, identificando estratégias mais adequadas aos contextos e o alcance dos objetivos pretendidos, a partir da incorporação dos desfechos de implementação.

Resumen

Objetivo: Mapear sistemáticamente los estudios de implementación con foco en intervenciones dirigidas al desarrollo en la primera infancia, sus principales características y estrategias de implementación.

Métodos: Se planificó y ejecutó una revisión de alcance de la literatura global de acuerdo con las recomendaciones del Instituto Joanna Briggs. La búsqueda se realizó en nueve bases electrónicas (PubMed, Scopus, Embase, Health System Evidence, Social Systems Evidence, Cochrane, ERIC y CINHAL y BVS), desde el comienzo de la indexación hasta agosto de 2021.

Resultados: Las búsquedas mapearon 4105 referencias, de las cuales 2805 eran únicas. Luego de la clasificación, se leyeron 211 estudios completos y se incluyeron 82. El sector de la salud fue el más frecuente en las intervenciones, seguido de educación y servicio social. Las principales intervenciones fueron programas dirigidos al desarrollo infantil y estrategias centradas en la parentalidad, familia y nutrición. En total, el 89,0 % presentó a los infantes como beneficiarios directos de las estrategias. La duración promedio de las intervenciones fue de 14,5 meses y el 25,6 % de los estudios fundamentaron su metodología en *frameworks* para analizar la implementación de las intervenciones. La mitad analizó adaptaciones de las intervenciones o programas, mientras que el 29,3 % citó aspectos de equidad de la implementación.

Conclusión: Esta revisión de alcance permitió el análisis de un conjunto de intervenciones dirigidas a la primera infancia, lo que demuestra el potencial de los estudios de implementación de programas de desarrollo de la primera infancia e identifica estrategias más adecuadas a los contextos y al cumplimiento de los objetivos pretendidos, a partir de la incorporación de los resultados de implementación.

Introduction

In Brazil, early childhood is defined as the period covering the first six years or 72 months of a child's life.[1] This period is considered a window of opportunity, as there is an intense development of the brain, and children are sensitive and highly responsive to interventions that can improve the influence of external risk factors.[2] Therefore, prioritizing early childhood development (ECD) is essential in building healthy and productive societies where children can survive and thrive, values recognized in the sustainable development goals of the United Nations.[3]

Globally, it is estimated that 43% of children are at risk of developmental delay due to extreme poverty and chronic malnutrition and at least one in three children fail to reach their full physical, cognitive, psychological and socio-emotional potential due to risk factors for ECD.[4,5]

To overcome barriers to optimal ECD, the Nurturing Care Framework (NCF) from WHO, UNICEF and the World Bank provides an evidence-based roadmap of how children develop and which policies and interventions improve early child development, and proposes actions in five domains (Good Health, Adequate Nutrition, Opportunities for Early Learning, Security and Safety, and Responsive Caregiving), responding to the Global Strategy for Women's, Children's and Adolescents' Health (2016–2030).[6] In Brazil, public policies such as the National Policy for Comprehensive Child Health Care, published in 2015[7] and the Legal Framework for Early Childhood, 2016[1] prioritize the implementation of actions aimed at ECD beyond the survival of children.

Despite consistent evidence on the effective types of interventions for the promotion of ECD, the quality of programs varies and access to early childhood interventions remains low, especially among the most socially vulnerable children living in low- and middle-income countries. There is little understanding of the best way to deliver these interventions across the full range of existing sectors and the wide diversity of possible scenarios. Therefore, greater focus on implementation research of interventions that promote ECD is needed for advance in access to effective and quality services.[8]

Implementation research addresses the development of strategies to ensure that evidence-informed practices are successfully implemented in diverse contexts and populations.[9] This is a key tool for identifying and addressing major social, behavioral,

economic or management needs that prevent the effective implementation of programs in the "real world", as well as finding out whether or not the programs being implemented will have the intended impact or not and why.[10] Experts in the field of implementation research for ECD program have made efforts to identify implementation characteristics that made interventions effective and how to scale up these interventions in a sustainable manner.[8] In a context of expanding ECD programs in Brazil, implementation research can provide evidence to support their large-scale implementation. Therefore, the objective of this study was to systematically map implementation research focused on ECD-oriented interventions, identifying the main characteristics of interventions and the implementation analysis.

Methods

A scoping review was performed according to the methodological assumptions of the Joanna Briggs Institute.[11] Prior to the start of the study, the team developed and published a research protocol in the OSF repository (https://doi.org/10.17605/OSF.IO/TSV32). The PRISMA-ScR was used in the writing of both the protocol and the present article.[12] The research question was prepared based on the PCC acronym (Population: social actors in the area of early childhood; Concept: research in the field of Implementation Science; Context: interventions, strategies, programs and policies aimed at promoting ECD). The study was based on the following question: What implementation research focused on an intervention (strategy/program/policy) aimed at early childhood development is available?

Eligibility criteria

All social actors, such as decision makers, policy makers, professionals from different sectors (health, education, social assistance, etc.) and children's caregivers were included in the population. Actors outside the area of early childhood were excluded. Studies in the area of implementation science were considered in the concept, having as a reference the definition of implementation science proposed by Peters et al.[13], which is the scientific investigation on issues related to implementation - the act of carrying out an intention, which in health research can be policies, programs or individual practices (collectively called interventions). Regarding the context, interventions (strategies, programs, policies, etc.) aimed at promoting ECD (children aged 0-6 complete years or 72 months, as defined in the Legal Framework for Early Childhood) were included.[1] Studies with interventions aimed at promoting ECD in children with specific needs, such as children with disabilities, premature infants, children with autism spectrum disorder (ASD) or individuals with some pathology were excluded by understanding the specific characteristics of this population that require interventions to meet the needs related to treatments and rehabilitation, different from those for the promotion of ECD. Studies that only discussed implementation science theories/models without presenting interventions aimed at ECD were also excluded.

Finally, there was no restriction regarding the study design or year of publication, and primary and secondary studies (quantitative, qualitative and mixed methods) in Portuguese, English and Spanish were included. Technical research reports were also included, but theses, dissertations, books and course completion papers were not included due to the large volume of retrieved documents and the time available to perform the review.

Search strategy

For the construction of the search strategy, terms related to the components of the research question (PCC) were mapped, including descriptors (DeCs, MeSH, Emtree), synonyms and free terms. A search strategy was built for PubMed, which was validated by a librarian and later adapted for VHL, Scopus, Embase, Health System Evidence, Social Systems Evidence, Cochrane, ERIC and CINHAL. Filters were used for English, Spanish and Portuguese, without delimitation of publication date. The searches were carried out on August 15, 2021 and the strategies can be consulted in chart 1.

Chart 1. Summaries of search strategies performed in databases

Database	Query	Results
S PubMed	Search: ((“Child Development”[Mesh]) OR (“Child Development”[Title/Abstract] OR “Child developmental”[Title/Abstract] OR “Childhood development”[Title/Abstract] OR “Infant Development”[Title/Abstract] OR “Early child development”[Title/Abstract] OR “Early childhood development”[Title/Abstract])) AND ((“Implementation Science”[MeSH Terms]) OR (Implementation [Title/Abstract] OR “Dissemination Science”[Title/Abstract] OR “Dissemination research”[Title/Abstract] OR “Dissemination”[Title/Abstract])) Filters: English, Portuguese, Spanish Sort by: Most Recent	904
Embase	((‘child development’/exp AND [embase]/lim) OR (‘child development’:ab,ti OR ‘child developmental’:ab,ti OR ‘childhood development’:ab,ti OR ‘infant development’:ab,ti OR ‘early child development’:ab,ti OR ‘early childhood development’:ab,ti) AND [embase]/lim)) AND ((‘implementation science’/exp OR ‘implementation science’) AND [embase]/lim) OR ((‘implementation science’:ab,ti OR implementation:ab,ti OR ‘dissemination science’:ab,ti OR ‘dissemination research’:ab,ti OR ‘dissemination’:ab,ti) AND [embase]/lim))	587
Scopus	((TITLE (“Child Development” OR “Child developmental” OR “Childhood development” OR “Infant Development” OR “Early child development” OR “Early childhood development”) AND TITLE (“Implementation Science” OR implementation OR “Dissemination Science” OR “Dissemination research” OR “Dissemination”))) OR ((ABS (“Child Development” OR “Child developmental” OR “Childhood development” OR “Infant Development” OR “Early child development” OR “Early childhood development”) AND ABS (“Implementation Science” OR implementation OR “Dissemination Science” OR “Dissemination research” OR “Dissemination”))) OR ((KEY (“Child Development” OR “Child developmental” OR “Childhood development” OR “Infant Development” OR “Early child development” OR “Early childhood development”) AND KEY (“Implementation Science” OR implementation OR “Dissemination Science” OR “Dissemination research” OR “Dissemination”)))	975
CINAHL	((MH “Child Development” OR TI (“Child Development” OR “Child developmental” OR “Childhood development” OR “Infant Development” OR “Early child development” OR “Early childhood development”) OR AB (“Child Development” OR “Child developmental” OR “Childhood development” OR “Infant Development” OR “Early child development” OR “Early childhood development”)) AND ((MH “Implementation Science” OR TI (“Implementation Science” OR Implementation OR “Dissemination Science” OR “Dissemination research” OR “Dissemination”) OR AB (“Implementation Science” OR Implementation OR “Dissemination Science” OR “Dissemination research” OR “Dissemination”))	506
ERIC	(“Child Development”) AND abstract) “Implementation Science” OR Implementation)	457
VHL	Mh:(“Child Development”) OR ti:(“Child Development”) AND mh:(“Implementation Science”) OR ti:(“Implementation Science” OR implementation) AND (db:(“LILACS” OR “INDEXPSI” OR “BDENF” OR “IBECS” OR “MedCarib” OR “PAHOIRIS” OR “SES-SP” OR “WHOLIS” OR “tese”))	381
Cochrane Library	((MeSH descriptor: [Child Development] explode all trees) OR ((“Child Development” OR “Child developmental” OR “Childhood development” OR “Infant Development” OR “Early child development” OR “Early childhood development”):ti,ab,kw)) AND ((MeSH descriptor: [Implementation Science] explode all trees) OR ((“Implementation Science” OR Implementation OR “Dissemination Science” OR “Dissemination research” OR “Dissemination”)):ti,ab,kw))	246
Health System Evidence	(“Child Development” OR “Child developmental” OR “Childhood development” OR “Infant Development” OR “Early child development” OR “Early childhood development”) AND (“Implementation Science” OR implementation OR “Dissemination Science” OR “Dissemination research” OR “Dissemination”)	20
Social System Evidence	(“Child Development”) AND (“Implementation Science”)	29

Selection and eligibility

The screening process of titles and abstracts was carried out by two reviewers independently, and disagreements were resolved by a third reviewer. Likewise, the full texts of the included studies were evaluated by two reviewers independently. At this stage, the resolution of disagreements occurred by consensus in the pair of reviewers. The Rayyan[14] platform was used in both stages.

Data extraction

An electronic spreadsheet was prepared for data extraction and the following information was collected: (1) characterization of studies, (2) intervention to promote ECD, (3) implementation strategies, (4) implementation outcomes and (5) context. Each article was extracted by one reviewer and the extraction was independently checked by another reviewer. Disagreements were resolved by consensus. In data analysis, the studies were first described according to the year of publication (70’s, 90’s, 2000-2004, 2005-2009, 2010-2014, 2015-2019, 2020-2021), objectives presented (evaluate/analyze the implementation, evaluate the results of programs and interventions, identify barriers and facilitators, understand phenomena, report experiences and review the literature), and could be included in more than one objective. From the studies proposing to evaluate the implementation, the implementation aspects specified by the authors were extracted, and subsequently categorized according to Proctor et al.[15] (fidelity, acceptability, feasibility, appropriateness, penetration, adoption, sustainability, incremental cost, or without specification). The study designs were also presented according to the classification presented by their authors.

Subsequently, interventions to promote ECD were categorized as described by the study authors regarding the nature of the intervention (programs, strategies or unspecified), the objective (single objective or more than one objective) and form of delivery (single strategy, two strategies, more than two strategies, or unspecified). Other aspects analyzed were the subjects involved in the delivery (single actor, multiple actors); target audience (single population, more than one target population, no description), inclusion of public beneficiary of the intervention (children, others, unspecified) and age

of children (0-36 months, up to 6 years, unspecified age range of the early childhood); duration of the intervention (related to the total duration of the intervention in weeks, months, years or related to the child's age group); intervention frequency (related to daily, weekly, fortnightly, monthly delivery, related to the mode of delivery, combination of frequencies depending on the form of delivery), sectors involved (health, education, social services, intersectoral, unidentified) and country classified according to the four income groups proposed by the World Bank in 2020:[16] low, low-middle, high-middle and high; and scope (local, regional, national, more than one level, not described).

The implementation strategies identified were categorized according to the proposal of the Expert Recommendations for Implementing Change (ERIC)[17] study and the implementation outcomes according to the Implementation Outcomes Framework.[15] The categorization of implementation strategies and outcomes was conducted by two researchers independently, and disagreements were resolved by consensus. Finally, two aspects of the context were mapped: adaptations and equity. Adaptations were classified according to the moment of implementation (prior to or during implementation) and equity aspects were classified as operationalized by the PROGRESS-Plus.[18]

Searches in electronic databases returned 4,105 references, of which 2,805 were unrepeated. After screening by titles and abstracts, 211 studies were read in full and 82 of these[3,19-99] were included (Chart 2). The article selection process is described in figure 1.

Results

Characteristics of the studies

The general characteristics of the studies are presented in table 2. The first study identified was from the 1970s, and the vast majority was published between 2015-2019 (46.3%; n = 38) and 2020-2021 (25.6%; n = 21). Regarding the design, 11 studies (13.4%) were identified by the authors as implementation studies that included the evaluation of efficacy/effectiveness; seven (8.5%) were identified only as implementation studies. Other frequent designs were mixed method studies (18.3%; n = 15), qualitative (15.9%; n = 13), evaluation (13.4%; n = 11), review studies (7 .3%; n = 6), descriptive and cross-sectional (6.1%; n = 5), case studies (3.7%; n = 3) and two (2.4%) pilot implementation studies. Nine studies did not describe the design adopted (11%). Regarding objectives, most intended to analyze or evaluate the implementation of the programs and interventions addressed (36.6%; n = 30) and detail barriers and facilitators relevant to the process (29.3%; n = 24). The remaining works aimed to report implementation experiences (20.7%; n = 17), evaluate the results of programs and interventions (14.6%; n = 12), understand interventions or specific phenomena related to them (9.8% ; n = 8) and perform a review of the literature (4.9%; n = 4).

Characteristics of the interventions

Figure 2 describes the characteristics of the interventions studied, presenting the sectors involved, the interventions addressed, their objectives, target audience, beneficiaries, scope, duration and countries. Figure 3 describes the implementation strategies and outcomes.

Most studies (35.4%, n = 29) involved the health sector in interventions, followed by the education sector (18.3%, n = 15) and social services (1.2%, n = 1). The others (31.7%, n = 26) occurred at an intersectoral level or developed stages in different sectors. When interventions referred to programs, the most frequently discussed were Early Head Start and the Integrated Child Development Service (ICDS), both mentioned in five studies. Next, with two citations each, *Chile Crece Contigo* and Research on Integration of Nutrition, Early Childhood Development and WASH (RINEW) appeared. The other programs were covered in a single study. In 22 works (26.8%), only the strategy was mentioned without reference to a specific program. Of these, one described two strategies, and two did not present a description of a program or strategy. Regarding the objectives of interventions, 67% (n = 55) of the studies had a single objective, in which it stands out that 22% (n = 18)

Chart 2. General characteristics of included studies

Study	Objective	Study design	Intervention					Implementation outcome
			Name	Objective	Duration	Who delivers	To whom	
Radner et al., 2018[3]	To offer concrete suggestions for innovators and decision makers to use, modify, and continue the transition for impact at scale.	Review	Saving Brains portfolio, containing 84 innovative strategies in low- and middle-income countries	To improve child development outcomes in the first 1,000 days of development	Home visits, services in clinics, community centers and daycare centers of unspecified duration	Community health workers, community members, or non-medical professionals	Children in the first 1,000 days of life	Fidelity, appropriateness, penetration, sustainability
Álvarez, et al., 2016[19]	To evaluate the impact of implementing the Growing Up Happily in the Family program on parenting skills and children's development	Unspecified	Growing Up Happily in the Family	To promote child development by improving parental skills and family learning environments	Weekly 90-minute groups for 4 to 5 months, or 9 weekly 90-minute home visits for 4 months	Facilitators	Children aged 0 to 5 years	Fidelity, acceptability, appropriateness, adoption
Aronna, 2006[20]	To identify the conditions for implementing the *Programa Materno Infantil y Nutrición – PROMIN* (Mother and Child and Nutrition program) in Rosário, Argentina	Case study	*Programa Materno Infantil y Nutrición - PROMIN* (Mother and Child and Nutrition program)	To reduce maternal and child morbidity and mortality and promote the psychosocial development of children between 2 and 5 years of age	Total duration of 3 years, but dose was not specified	Unspecified	Children with malnutrition and age < 6 years	Acceptability, appropriateness, penetration
Atashbahar et al., 2021[21]	To identify the factors that affect the policymaking process for early childhood development and clarify how these factors affect decision-making and create challenges in this regard	Qualitative study	Development of integrated early childhood development (IECD) policies	To develop integrated child development policies to promote a safe environment for children and their families	Unspecified	Services and strategies that provide primary health care, adequate nutrition, education and nutrition	Children up to 8 years of age	Feasibility, appropriateness, incremental cost
Barboza et al., 2018[22]	To investigate the content of meetings between families and professionals during home visits and gain a deeper understanding of how it relates to the concepts of proportional universalism and equitable development in early childhood	Qualitative study	Postnatal Extended Home Visit Program	To decrease risk factors while increasing protective factors for children's well-being and health by strengthening parental self-efficacy and health	Up to 6 visits, 15 months	Nurses from the child health care team + parental advisor from the local social service	First time parents	Fidelity, acceptability, appropriateness
Bawani, et al., 2021[23]	To investigate the role of teacher training in the implementation of Botswana's Pre-primary Curriculum Framework (PCF) in Francistown	Qualitative study	Pre-primary Curriculum Framework (PCF)	To promote professional development of teachers to achieve quality education, universal access to education, equitable education and lifelong learning	Unspecified	Department of Curriculum and Assessment	Pre-primary school children	Fidelity, acceptability, feasibility
Beasley et al., 2021[24]	To understand the factors influencing the early program enrollment and involvement, as well as recruitment strategies that can be improved	Qualitative study	Legacy for Children	To promote child development (cognitive, language, behavioral and socio-emotional development) and build maternal self-efficacy through support networks	Total duration of 3 years, with 9 blocks of 10 consecutive weekly sessions with 4-6 week-intervals after each session	Bilingual and bicultural group leaders	Latina mothers of children up to 3 years old	Acceptability, feasibility, appropriateness
Berry et al., 2000[25]	To identify barriers and facilitators to implementing child development services in healthcare institutions managed by Medicaid Managed Care Organizations (MMCOs)	Qualitative study	Child development programs or services in MMCOs	To evaluate programs and services in different MMCOs with different objectives	Unspecified	Nurses, obstetricians, pediatricians, social workers, speech therapists, physical therapists, office staff, counselors, case managers	Pregnant women and childcare workers	Acceptability, appropriateness, adoption, sustainability
Berry et al., 2008[26]	To assess the feasibility and success of the Assuring Better Child Health and Development (ABCD) program	Qualitative study	Assuring Better Child Health and Development (ABCD)	To expand and improve the delivery of child development services to low-income children through the health sector in four US states	Unspecified	The four selected states were free to design any child development program	Children under age 3 enrolled in Medicaid	Feasibility, appropriateness, penetration
Bingham et al, 2016[27]	To examine the implementation of an early literacy intervention - Systematic and Engaging Early Literacy (SEEL) - in literacy	Quasi-experimental study	Systematic and Engaging Early Literacy (SEEL)	Promote kindergarten children's literacy skills as phonological awareness skills	Unspecified	Teachers	Kindergarten children	Fidelity, acceptability

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Continuation.

Study	Objective	Study design	Intervention					Implementation outcome
			Name	Objective	Duration	Who delivers	To whom	
Black et al., 2015[28]	To analyze the impact of integrated interventions on linear growth and cognitive development	Review	Interventions integrating nutrition and child development presented at the Scientific Sessions of the American Nutrition Association Annual Meeting held in 2015 in Boston, Massachusetts, USA	Unspecified	Unspecified	Unspecified	Children under 5 years old	Fidelity, appropriateness, penetration, adoption
Buccini et al., 2021[29]	To analyze barriers and facilitators of the implementation, expansion and sustainability of the *Programa Criança Feliz* ("Happy Child" Program PCF) from the point of view of key informants at the federal and state levels	Case study	*Programa Criança Feliz* ("Happy Child Program")	To teach parents how to provide early childhood learning opportunities by helping them develop responsive parenting skills	Weekly home visits for children under 3 years old and monthly visits for pregnant women	Supervisors and home visitors	Pregnant women and caregivers of children under 36 months in socially vulnerable or at-risk situations and children under 72 months with disabilities	Fidelity, acceptability, penetration, adoption, sustainability
Canada, 2009[30]	To examine design and implementation issues, initial progress in achieving immediate objectives, and issues related to accountability	Formative assessment	Understanding the Early Years (UEY) Initiative	To identify gaps in services and programs for young children and their families and to develop a Community Action Plan	Unspecified	Unspecified	Children aged 5 years entering preschool	Fidelity feasibility, appropriateness, penetration, adoption
Cavallera et al., 2019[31]	To identify barriers and facilitators to scaling ECD projects	Qualitative study	Early childhood development projects in low- and middle-income countries	Unspecified	Unspecified	Unspecified	Children in early childhood	Fidelity, acceptability, feasibility, penetration, sustainability
Corter et al., 2008[32]	To examine the use of the early development instrument as a cumulative assessment tool and a formative tool for improvement of the Toronto First Duty (TFD) program	Case study	Toronto First Duty (TFD)	To offer integrated services developed in public schools, combining actions for children with kindergarten and daycare centers, and support for parents	Unspecified	Schools (involvement of teachers, childcare professionals, management, etc.)	Children throughout the first 6 years of age	Fidelity, acceptability, feasibility
Culp et al., 2004[33]	To assess implementation fidelity and parenting outcomes when infants were one year old	Evaluation study	Unspecified	To teach about child development and parenting, child and maternal health, and modeling parenting skills	Weekly visits for the first month (28 weeks of pregnancy) and then biweekly for the rest of the pregnancy. When babies were born, weekly visits for the first three months; biweekly from 3 to 21 months; and monthly from 21 to 36 months	Child development specialists	Pregnant women who would be mothers for the first time were monitored until the child's first year of life	Fidelity
Draper et al., 2021[34]	To document the dissemination process of the South African Guide and report the feasibility and acceptability of implementing dissemination workshops	Mixed methods evaluation study	24-hour South African movement guide	To disseminate the guide to end users	Unspecified	Community-based organizations team	Caregivers of children aged 0-5 years and caregivers in school centers	Fidelity, acceptability, feasibility, appropriateness
Draper et al., 2019[35]	To assess the feasibility and acceptability of a home-based intervention - Amagugu Asakhula	Pilot study	Amagugu Asakhula	To promote caregivers' ability for the promotion of health and development of preschool-age children	Intervention during six weekly home visiting sessions	Community Health Agents	Women caregivers of preschool children aged 3-5 years in a low-income environment	Acceptability

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Continuation.

Study	Objective	Study design	Intervention					Implementation outcome
			Name	Objective	Duration	Who delivers	To whom	
Drummond et al., 2002[36]	To evaluate a home support program for at-risk mothers and their children	Evaluation study	Parent Support Program	To develop parental capacity and child development skills in young families living in risk situations	2±4 hours per week are offered through home visiting programs, parenting support and children's programming at the center. Employees may provide 15±20 hours of service per week to meet with family members, ranging from 4-6 weeks to less than 6 months	Multidisciplinary program with a primary health focus (e.g. immunization, child nutrition, antenatal health, postpartum recovery)	Children aged 0-3 years	Fidelity
Duggan et al., 1999[37]	To evaluate the Hawaii's Healthy Start Program (HSP) after two years of implementation and follow-up of families	Evaluation study	Hawaii 's Healthy Start Program (HSP)	To prevent child abuse and neglect and promote health and development in newborns of families at risk for poor child health outcomes	Three years with weekly visits at first, gradually decreasing to quarterly visits as family functioning improves	Home visitors (trained but unlicensed professionals), recruited from the community with essential qualities to work with vulnerable families	Parents and newborns in vulnerable situations (at risk of child abuse or neglect)	Fidelity
Duggan et al., 2018[38]	To describe the services provided to families and how these services vary depending on the characteristics of families, home visitors, local programs, other home visiting stakeholders, and communities	Mixed methods evaluation study	Four models of home visits delivered by US Departments of Health: Early Head Start; Healthy Families America; Nurse-Family Partnership; and Parents as Teachers	To promote early childhood through home visits to families	Unspecified	Unspecified	Mothers and pregnant women aged 15 or over and children up to 6 months of age	Fidelity, acceptability, appropriateness, incremental cost
Ealy, 2017[39]	To investigate the feasibility of adapting and implementing the Building Early Emotional Skills (BEES) curriculum	Viability study	Building Early Emotional Skills (BEES)	To promote self-awareness exercises that help parents understand their children's behaviors and attitudes	Weekly home visit	Unspecified	Children aged 3-30 months in Mexican immigrant families	Feasibility, appropriateness
Elsey et al., 2020[40]	To deepen and broaden understanding of the demand for childcare centers, and explore the feasibility of delivering the intervention (a daycare center)	Mixed methods evaluation study	Child care centers	To implement child care centers	10 months	Team of centers	Children up to 5 years old	Acceptability, feasibility, appropriateness, sustainability, incremental cost
Folger et al., 2016[41]	To evaluate the effectiveness of community home visiting improvement to strengthen home visiting participation and improve Every Child Succeeds program impact	Retrospective, quasi-experimental study	Community-based enrichment home visiting (CBE-HV)	To promote the engagement of families in home visits anchored in community strengthening	Weekly home visits in the first and last four weeks of antenatal care, and biweekly for the rest of pregnancy. Subsequently, home visits occurred weekly and eventually decreased to monthly visits	More than 70% of visits were carried out by a primary agency	Children from 0 to 3 years old	Fidelity, acceptability, appropriateness, adoption
Fracolli et al., 2018[42]	To report the experience of implementing the Young Mothers Caregiver Program of Home Visits	Case study	Young Mothers Caregiver Program of Home Visits	To promote parenting through home visits in five axes of care	The average number of visits to be performed by period: 10-15 visits during pregnancy; 4-6 visits in the postpartum period; and around 40 home visits between the child's 2 months to 18 months of age. In total: 58-63 visits every two weeks	Nurses	Teenage mothers entered the program from 8-16 weeks of pregnancy and should remain until the child completed 18 months old	Acceptability, feasibility, penetration, adoption
Gaitán-Rossi et al., 2019[43]	To assess PROSPERA DIGITAL (PD) implementation fidelity using six dimensions; adherence, quality, responsiveness, intervention complexity, facilitation strategies, and program differentiation	Qualitative study	PROSPERA DIGITAL (PD)	To promote advice and guidance through mHealth platform via SMS messages about maternal health and child care, nutrition and breastfeeding, appointment reminders, and medical vaccinations	SMS text messages are sent during pregnancy and the first 2 years of the baby's life	mHealth platform	Pregnant women and children up to 2 years of age	Fidelity

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Continuation.

Study	Objective	Study design	Intervention					Implementation outcome
			Name	Objective	Duration	Who delivers	To whom	
González-Fernández et al., 2020[44]	To compare the improvement in the health and development of children aged 0-3 years between communities that created community and home gardens and promoted conscious nutrition and meal preparation workshops to improve caregiver-child interaction in peripheral settlements of Lima	Prospective before-and-after intervention study	Wawa Illari	To improve the health and development of children, including a food security perspective	18 months (study period)	Community health promoters	Children aged 0-3 years	Fidelity, acceptability, feasibility, appropriateness
Hewer et al., 2006[45]	To determine if the implementation of the early literacy program in Geraldton, Western Australia contained the characteristics of previously implemented effective programs.	Mixed methods evaluation study	Early Literacy Program	To improve literacy development in early childhood by providing parents with appropriate book and information about reading to children	The package of materials is given to parents of babies during their routine 7-9 months exam	Children's health clinics and nurses	Parents of children attending the child's 7-9 months routine exam	Fidelity acceptability, appropriateness, adoption
Jack et al., 2015[46]	To adapt and evaluate the Nurse–Family Partnership (NFP) home visiting program	Qualitative case study	Nurse–Family Partnership (NFP)	To promote parenting skills through home visits	It begins during pregnancy and continues until the child is two years old	Nurses	First-time mothers, socially and economically disadvantaged	Fidelity, feasibility
Jahir et al., 2021[47]	To examine the facilitators and barriers to implementing an intervention integrating child stimulation and maternal and child health interventions in rural Bangladesh	Randomized Controlled Trial	Integration of Nutrition, Early Childhood Development and water, sanitation, hygiene (RINEW)	To deliver integrated health, child development and sanitation interventions for pregnant women and caregivers of children up to 15 months of age	Total duration of 9 months with a total of 18 sessions: 9 in group, 9 home visits	Community health workers deliver group sessions or home visits	Pregnant women and caregivers of children up to 15 months of age	Fidelity, acceptability, feasibility, appropriateness
Kavle et al., 2019[48]	To describe the implementation process of the baby-friendly community program in the Kenyan health system	Descriptive study	Child-friendly community initiative	To promote breastfeeding, complementary feeding and maternal nutrition with a focus on supporting reproductive, maternal, neonatal, child health and nutrition interventions to prevent maternal and child mortality	From October 2014 to December 2017	Ministry of Health with technical assistance from the Maternal and Child Survival Program (MCSP) and UNICEF	Pregnant, breastfeeding and grandmother caregivers assisted in five counties in Kenya	Fidelity, penetration, adoption, sustainability
Khan et al., 2017[49]	To explore the implementation of ECD intervention in primary-level private healthcare facilities in Pakistan	Mixed methods evaluation study	Structured clinical counseling session in combination with community strengthening activities	To promote maternal skills, nutrition and stimulation of early childhood and mothers' mental health	A 10-minute session when the child was <6 weeks, at 3 months, 6 months and 9 months of age	Clinical assistants and physicians	Mothers with children aged <6 weeks to 9 months	Fidelity, acceptability, feasibility, appropriateness, adoption
Kisker et al., 2002[50]	To describe implementation experiences of the 17 research programs of the Early Head Start program (EHSP) between 1995/1996 and 1999	Evaluation study	Early Head Start program (EHSP)	To promote improvement of issues related to child and family development	Unspecified	Child care teams	Families and children aged 0-3 years	Fidelity acceptability, feasibility, appropriateness
Kitsao-Wekulo et al., 2021[51]	To describe the development of a cell phone application for use among caregivers [of children] and determine the feasibility and preliminary impact on the child's developmental progression	Cross-sectional study	Messaging application	Helping young mothers respond to their children's development needs in a timely manner	12 months with monthly messages about ECD milestones and instructions on how to stimulate the child if the milestones were not being reached	Cell phone app and community health volunteers	Caregivers of children between 6 and 24 months	Acceptability, feasibility
Kohli-Lynch et al., 2020[52]	To describe human resources and curriculum content for implementing Responsive Caregiving and Early Learning (RCEL) projects in several low- and middle-income countries using data from the Saving Brains portfolio	Mixed methods evaluation study	Responsive Caregiving and Early Learning (RCEL)	To improve brain development by preventing brain injuries, promoting stimulating and responsive environments, and/or protecting children from developmental risk factors	Unspecified	Unspecified	Children in the first 1,000 days of life	Fidelity, appropriateness

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Continuation.

Study	Objective	Study design	Intervention					Implementation outcome
			Name	Objective	Duration	Who delivers	To whom	
Krippel et al., 2020[53]	To determine the feasibility and effectiveness of the Baby TALK and Parents Interacting with Infants (PIWI) interventions among families of at-risk young children and identify potential barriers to implementing these two interventions in the State of Illinois, USA	Pilot study with pre- and post-intervention evaluation	Integration of two interventions: Baby TALK (home visiting service) and PIWI (home visiting service and play groups in a children's school) into the CU Early program	To provide preventive services that respond to a family's risk factors and specific needs with a view to positively impacting child development in children from antenatal care to three years of age, while enriching the relationship between parents and children	Unspecified	Unspecified	Parents of children ages 0 to 3 years "at risk" for school failure and health problems	Fidelity, acceptability, feasibility
Larson, 2000[54]	To assess barriers and facilitators of the Even Start program for the Department of Education in the State of Maine, USA	Mixed methods evaluation study	Even Start	To meet the learning needs of the entire family using an integrated educational model that includes early childhood education, adult literacy, and parental education	Unspecified	Unspecified	Families most in need in their districts	Fidelity, acceptability, feasibility, appropriateness
Leer et al., 2019[55]	To describe the implementation of home visiting programs in seven countries: Bolivia, Brazil, Ecuador, Jamaica, Nicaragua, Panama and Peru	Qualitative study	Home visiting programs	To provide caregivers with the information and skills needed to promote their child's health development and learning through a series of home visits	Visits were observed throughout four months. At least five visits, average duration of 40 to 56 minutes each; one of the locations had an average visit duration of 18 minutes	Trained healthcare professionals or professionals	Caregivers and children. Age was not described, but children observed in ECD programs were aged 16.2-26.5 months on average	Fidelity, acceptability
Love et al., 2009[56]	To assess the quality, intensity and implementation of the second phase of the Los Angeles Universal Preschool Program (LAUP)	Descriptive study	Los Angeles Universal Preschool (LAUP) Program	To achieve LAUP quality criteria in all preschools	Unspecified	Public (both traditional and charter) and private preschools and schools, Head Start centers, and child care homes	Schools with 4-year-old children	Fidelity, acceptability, feasibility
Lucas et al., 2018[57]	To describe the Care for Child Development (CCD) program and determine where and how the CCD has been implemented and identify modes of delivery	Review	Care for Child Development	To assist caregivers in building relationships with young children and solving comprehensive care problems	Variable, usually a counseling appointment, and follow-up afterwards	Counselors, who are health professionals, educators, community health agents, etc.	Children up to 5 years old	Fidelity, acceptability, feasibility, penetration, sustainability
Luoto et al., 2021[58]	To assess the determinants of Msingi Bora implementation, including program uptake and fidelity of delivery, and its association with parent and child outcomes in rural Kenya	Mixed methods evaluation study	Msingi Bora	To promote early childhood development (cognitive, language and socio-emotional development) through group activities with parents that include activities around responsive play and talking to children.	12 group sessions plus 4 evaluation meetings. Biweekly meetings.	Community health volunteers	Female caregivers aged 15 or over and children aged between 6 and 24 months	Fidelity, acceptability, feasibility, appropriateness, penetration, sustainability
Manz et al., 2017[59]	To examine the impact of the Little Talks program integrated into Early Head Start home visits and monitor intervention fidelity and provide biweekly performance feedback to home visitors	Experimental study	Little Talks	To strengthen infants' and toddlers' language and their emerging literacy skills for use in home visiting programs	Twenty-four lessons are designed for integration into home visits, with various combinations of speech acts (requests or dispositions) along with an increasingly complex sequence of content foci (labels, events, personal experiences, character feelings)	The intervention was delivered by home visitors from the existing program (Early Head Start)	Low-income parents of children under 3 years old	Fidelity, acceptability, feasibility
Mckay, 2006[60]	Unspecified	Evaluation study	Training through the Strengthening Developmental Surveillance and Referral Practices of Child Health Providers project	To educate child health providers (pediatrics and family health providers working in primary care) in the early detection and identification of developmental and behavioral issues in childhood and in the use of the Help me Grow referral system	Trainings were brief, but the duration was not specified	Health professionals with community work in the area of child health	The average age of children cared for by trained professionals was 23 months	Fidelity, feasibility, penetration

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Study	Objective	Study design	Intervention					Implementation outcome
			Name	Objective	Duration	Who delivers	To whom	
McKay et al., 2006[61]	To report the experience with the design and implementation of the ChildServ program and implications for subsequent program expansion	Case study	ChildServ	To increase early detection of development problems from existing initiatives	Unspecified	Child health professionals, health department managers, parents' groups	Children up to 4 years old	Feasibility, acceptability, incremental cost
Meier et al., 2017[62]	To describe and compare an overview of ECD policy and practice in South Africa and Turkey	Comparative case study	Programs aimed at ECD promote or support children's development, including groups of children in education centers and/or the community, or home-based programs	To promote ECD	Unspecified	Unspecified	In South Africa, children between birth and nine years of age. In Turkey, children aged 0-6 years	Fidelity, appropriateness, penetration
Meyers et al., 2019[63]	To describe the findings on the feasibility and degree of implementation of the CASEL model in 14 educational team leaders, who were supported by coaches in social and emotional learning	Part of a large cluster randomized trial	PATH	To implement a curriculum on social and emotional learning	Two years	Coaches and school leaders	Teachers of 1st-3rd grade students	Fidelity, acceptability, feasibility
Morelli et al., 2014[64]	To identify challenges for tracking development in low-income urban contexts and assess the feasibility and acceptability of these strategies	Exploratory mixed methods study	Development tracking	To prepare pediatricians to establish developmental screening with parents during regular office visits	30 months. Child development tracking took place at 9-, 18-, 24- and 30 months-visits	Pediatricians (residents and assistants)	Caregivers of children up to 30 months and pregnant women over 36 weeks of pregnancy	Feasibility, acceptability
Morrison et al., 2018[65]	To explore the factors that affect presence/attendance and follow-up in follow-up appointments of the Thai national development monitoring program and work out ways to overcome them	Action research, using qualitative methods	Development tracking	To monitor child development	Monitoring child development at each vaccination visit at 9, 18, 30 and 42 months and counseling of caregivers	Health professionals	Tests on children up to 42 months	Fidelity, acceptability, feasibility, appropriateness, adoption
Murphy et al., 2018[66]	To review implementation research for ECD programs (targeting children 0-8) in humanitarian settings	Qualitative review study	Early childhood interventions in conflict and post-conflict settings	To promote learning activities and learning activities between parents and children	Group sessions for psychosocial support for mothers in combination with home visits; story telling activities for children and giving them a toy to hug and offer care; group sessions with a "parents make a difference" theme combined with home visits	Unspecified	Age of target children in studies ranged from 6 months to 7 years	Fidelity, acceptability
Nair et al., 2020[67]	To analyze implementation and adaptations in the Integrated Child Development Services (ICDS) program	Pilot study	Integrated Child Development Services program (ICDS)	To increase parental involvement in childcare and assess the impact on child development	Total duration of 1 year, with monthly meetings with parents	Community workers at child care centers	Fathers and mothers of low socioeconomic status and their children aged 0 to 3 years	Fidelity, acceptability, appropriateness
Natale et al., 2020[68]	Unspecified	Unspecified	Jump Start	To promote socio-emotional development and minimize behavioral difficulties in children	Duration: each session lasted approximately 45 minutes Frequency/Intensity/Dose: 10-12 sessions	Specialists in emotional and social support	Children aged 1-5 years in educational centers located in low-income regions and belonging to multi-ethnic groups	Fidelity, acceptability, penetration, adoption, sustainability

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Continuation.

Study	Objective	Study design	Intervention					Implementation outcome
			Name	Objective	Duration	Who delivers	To whom	
Nicholson et al., 2010[69]	To examine changes between pre- and post-intervention and variations according to implementation location	Evaluation study	Sing & Grow	To promote positive parenting and child development through music therapy	Ten 1-hour sessions held weekly for groups of 8-12 parent-child dyads	Clinicians	Parents in vulnerable situations, from the birth of the child until the age of 3 years	Fidelity, acceptability
Nores et al., 2018[70]	To understand the quality of implementation of the aeioTU program, and support a process of continuous improvement in Colombia	Evaluation study	aeioTU	To provide home visiting and childcare services at most of its centers	Services are offered 11 months of the year and serve children for 9 hours a day	Teachers and teacher assistants	Children aged 0 to 5 years	Fidelity, acceptability
Ogegbo et al., 2020[71]	To examine ECD teachers' perceptions of the use of technology in early childhood classrooms in South Africa	Qualitative study	Information and communication technologies (ICT)	To provide mobile and desktop systems as well as interactive toys and Internet-enabled technologies that act as solutions for consumption in interactive media and popular culture by young children	Unspecified	Early childhood education teachers	Children in early childhood classes	Acceptability
Pal, 2020[72]	To examine the coverage and quality of implementation of the preschool education (PSE) under the Integrated Child Development Services program (ICDS)	Descriptive study	Preschool Education (PSE)	To prepare children to face formal schooling	Unspecified	Anganwadi Centers (AWCs)	Children aged 3-6 years	Fidelity, penetration
Paulsell et al., 2002[73]	To assess program implementation and quality of services for child development in the 17 research programs of the study	Does not describe	Early Head Start	To provide intensive services starting before birth and focusing on improving child development and support for families with home visits and ECD services.	Each project designs its own program with intensity and duration	Each project designs its own program	Families with children from before birth to 3 years old	Fidelity, feasibility
Peisner-Feinberg et al., 2020[74]	To examine local variations in state implementation of Pennsylvania Pre-K Counts (PA PKC) in relation to program regulations and early learning standards	Implementation study	Pennsylvania Pre-K Counts (PA PKC)	To provide high-quality preschool to children who lack opportunities or reside in environments that place them at risk for academic failure	Unspecified	Unspecified	Children aged 3-4 years who lack opportunities or live in environments that put them at risk of academic failure	Fidelity, acceptability, appropriateness
Pérez-Escamilla et al., 2018[75]	To examine the process of scaling up ECD programs in four major countries through application of the Complex Adaptive System (CAS) framework	Qualitative study	Chile: *Chile Crece Contigo (ChCC)* India: Integrated Child Development Services program (ICDS) South Africa: Grau R Bangladesh: *Shishu Bikash Kendra (SBK)*	To promote ECD	Each program has its own design with intensity and duration	Programs provide universal and differentiated interventions in school, community and home environments	Chile: < 4 years; India: < 6 years: South Africa: 4,5-6 years; Bangladesh: 0 to adolescence	Fidelity, adoption, sustainability
Ponguta et al., 2019[76]	To characterize the implementation and evaluation of the Mother-Child Education Program Among Refugee and Other Vulnerable Communities (MOCEP) in Beirut	Intervention study using mixed methods	Mother-Child Education Program Among Refugee and Other Vulnerable Communities (MOCEP)	To promote positive parenting practices (such as reducing harsh discipline) and improve young children's school readiness	25 weekly sessions between groups of mothers, each lasting approximately 3 hours	Unspecified	Mother, or other female primary caregiver who could read and write Arabic with a child between 2 and 7 years of age	Fidelity, acceptability, penetration
Rao et al., 2018[77]	To analyze the Integrated Child Development Services (ICDS) program in India and discuss challenges in expanding the implementation based on results from national studies	Review	Integrated Child Development Services (ICDS)	To improve the nutritional and health status of children; ensure a solid foundation for their psychological, physical and social development; reduce the incidence of mortality, morbidity, malnutrition and improve the capabilities of caregivers in relation to children's health and nutritional needs; and achieve effective interdepartmental coordination of policy and implementation	Provide six community services related to nutrition, health, preschool and education	Unspecified	Children under 6 years old	Fidelity, penetration, feasibility, adoption

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Continuation.

Study	Objective	Study design	Intervention					Implementation outcome
			Name	Objective	Duration	Who delivers	To whom	
Richer et al., 2018[78]	To describe the ECD program for Indigenous families developed in Cree territory in Quebec, and analyze the factors that influence the work of Indigenous family supporters	Unspecified	Mashkûpímâtsît Awash	To maximize the health and well-being of pregnant women, children and their families by acting on the network of social determinants of health for indigenous people	First antenatal consultation/ visit and continues thereafter. The frequency of consultations/ visits depends on the needs of each family	Family supporters from the community itself	Indigenous families from Cree territory. There is no minimum or maximum age, it starts during pregnancy and extends to the whole family	Fidelity, acceptability, feasibility, appropriateness, incremental cost
Rusu et al., 2019[79]	To examine the attitudes and practices of a group of family physicians responsible for health supervision of the program called Citesc Zilnic in outpatient clinics in the county of Cluj, Romania	Exploratory study using mixed methods	Citesc Zilnic (Always Ready, free translation)	To promote child development through literacy	18 months	Family physicians	Children in early childhood	Fidelity, acceptability, feasibility, appropriateness
Sahoo et al., 2016[80]	To evaluate the operational aspects of implementation and use of the Integrated Child Development Service (ICDS) program in a rural area of Odisha in eastern India	Cross-sectional study	Integrated Child Development Service (ICDS)	To improve nutrition and health status of children by providing complementary nutrition and immunization; establish foundations for the child's psychological, physical and social development through preschool education; reduce the incidence of disease burden through appropriate referral; improve mothers' self-care capacity through health education	Unspecified	Female worker trained for the role, and an assistant	Children under 6 years old; pregnant and breastfeeding women	Fidelity, acceptability, feasibility, appropriateness, penetration
Sandler et al., 2000[81]	To evaluate program process and outcomes for children, families, staff, and community after five years of implementing the Phoenix Early Head Start program	Formative assessment	Early Head Start (Arizona version)	To provide ongoing, intensive and comprehensive child development and family support services to vulnerable families and their children from birth until children turn three	Weekly home visits and group activities take place monthly	Program team	Pregnant women aged 13-19 years, pregnant with their first child or with babies up to six months old, with follow-up of the child for up to three years	Fidelity, acceptability, penetration, sustainability
Sandler et al., 1999[82]	To document and analyze the program, participant data, and processes of the third year, or second full year of implementation of the Phoenix Early Head Start program	Formative assessment	Early Head Start (Arizona version)	To provide ongoing, intensive and comprehensive child development and family support services to vulnerable families and their children from birth until children turn three	Weekly home visits and group activities take place monthly	Program team	Pregnant women aged 13-19 years, pregnant with their first child or with babies up to six months old with follow-up of the child for up to three years	Fidelity, penetration
Shah et al., 2020[83]	To assess the feasibility and acceptability of integrating Sit Down and Play (SDP) in Karnataka, India	Prospective study using mixed methods	Sit Down and Play (SDP)	To educate caregivers about the importance of playing and interacting with a child to promote early childhood development in a healthcare setting serving a predominantly rural population in India	10-minute sessions with caregivers while waiting for their childcare appointment	SDP providers	Caregivers of children under 2 years old	Acceptability, feasibility, appropriateness
Singla et al., 2015[84]	To analyze barriers and facilitators related to implementation processes (content, training, supervision and delivery) from the perspective of agents and supervisors and mothers participating in the parenting program	Community -Based Randomized Trial	Integrated sessions on child development, maternal mental health and visits to assess the living environment	To promote relevant educational and parenting practices related to stimulation, hygiene and diet, and prevention of worsening of mothers' depressive symptoms	12 integrated child development and maternal mental health sessions	Community educators supervised by the team of the responsible organization	Mothers and fathers (in separate sessions) of children aged 12-36 months	Fidelity, acceptability, feasibility

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Continuation.

Study	Objective	Study design	Intervention					Implementation outcome
			Name	Objective	Duration	Who delivers	To whom	
Sitati et al., 2016[85]	To analyze if there were differences between private and public early childhood education centers in adherence to guidelines of the government service standards in providing physical facilities in Kakamega County, Kenya	Investigation	Standard guidelines on providing physical facilities for ECD programs	To promote physical facilities for ECD programs	Unspecified	Physical facilities in classrooms, furniture, water, sanitation and play facilities	Preschool children aged 3 to 6 years	Acceptability, feasibility, adoption
Slemming et al., 2021[86]	To reflect on experiences of implementing a new intervention in a complex environment to increase the frequency of ultrasound services during antenatal care	Randomized clinical trial	To increase the frequency of antenatal ultrasound services with information on child development	To improve child development and growth, breastfeeding practices, mother/father-infant bonding, maternal and paternal well-being, and routine clinical care	12 months (approximately) in total. Each participant had 3 visits: (1) <25 weeks pregnancy; (2) 6-week postnatal follow-up; and (3) 6-month outcome assessment	Trained sonographers and occupational and physical therapists trained in child development	Pregnant women and children up to 6 months	Fidelity, acceptability, feasibility
Smith et al., 2018[87]	To identify necessary modifications to training materials and procedures, and understand how the Reach Up program was received by delivery agents, parents and facilitators, as well as challenges to implementing the program	Unspecified	Reach Up	To improve child development by building mothers' skills in fun, helping their children play and learn, and improving mother-child interactions	Fortnightly home visits lasting 20-50 minutes	Home visitor	Children 6-48 months of age	Fidelity, acceptability, feasibility, appropriateness
Thompson et al., 2004[88]	To evaluate the outcome of the national Healthy Steps program when babies were three months old and discuss the implications of the findings for families, clinical practice, health systems, policies and future research	Descriptive study	Healthy Steps	To expand health care practices for infants and young children; promote developmental and behavioral support for pediatric practices in primary care	Families had 5-8 meetings with the specialist	Healthcare professional	Children aged 0 to 3 months	Acceptability
Toll, 1976[89]	Unspecified	Evaluation study	Pre-kindergarten Head Start (Philadelphia)	To improve the child's physical and emotional health, their family relationships and their abilities to function better as a person, based on increasing their ability to think, express themselves and relate in a more meaningful way with the environment	Unspecified	Trainers and Teachers	Teachers, parents and 3 and 4-year old students	Fidelity, acceptability, feasibility
Tomlinson et al., 2018[90]	To describe the implementation of the maternal and child health home visiting program, Philani+, and lessons learned from its implementation to facilitate the planning of upcoming interventions	Case study	Philani Mentor Mothers Program	To promote, through home visits for maternal and child health, training of mothers to become community health agents (mentors) in their communities	Unspecified	Community health agents	Pregnant women	Fidelity
Tomlinson et al., 2020[91]	To review implementation evidence for three of the most common types of programs to promote child development (home visits, parent groups, and daycares and education centers) and document how resources and implementation context can influence the effectiveness of programs	Review	Home visits, parenting groups (community-based or facility-based), and community daycare centers	To promote ECD	Unspecified	Trained and untrained professionals	Children under 5 years of age	Fidelity, feasibility, sustainability
Torres et al., 2018[92]	To identify lessons to replicate and scale up the Chile Crece Contigo (ChCC) program at the national and subregional level	Case study	*Chile Crece Contigo (ChCC)* is a complete, intersectoral and multicomponent policy (social protection system)	To help all children reach their full developmental potential, regardless of their socioeconomic status. It combines universal and targeted benefits	For as long as needed	Unspecified	Children up to 4 years old	Sustainability, feasibility

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Continuation.

Study	Objective	Study design	Intervention					Implementation outcome
			Name	Objective	Duration	Who delivers	To whom	
Walker et al., 2018[93]	To characterize implementation, including content, training and supervision of staff, and resources required in Jamaican health services	Cluster randomized trial	Parental interventions by health services	To use interactive strategies with demonstration of behaviors and activities, practice by parents, and encouragement and feedback to promote positive parenting	Fortnightly 30-minute home visits. In addition, presentation of short films lasting 20 minutes (6 weeks, 3, 6, 9, 12 and 18 months of age)	Community health agents and primary care services	Children between 6 weeks and 18 months of age	Fidelity, acceptability, feasibility
Weinstock et al., 2012[94]	To measure the impact of a caregiver training in the Program for Infant/Toddler Care (PITC) on child development and the program quality	Cluster randomized trial	Program for Infant/ Toddler Care (PITC)	To train about infant/toddler development and educate about practices that facilitate healthy and sensitive development for children's different communities, cultures, and languages of origin, promoting relationship-based care that meets the needs of children at each stage of development	64 hours of training and 40 hours of training (4 hours of monthly meetings) or other local support (coaching) for each participating nursery or group over 10-18 months	Program instructors, who are certified professionals in the method with higher education	Individual childcare centers (with at least five staff participating in training) and small groups of childcare providers for children under 3 years old	Fidelity, acceptability, adoption
Westerlund et al., 2017[95]	To assess factors that may affect the initial implementation of the International Child Development Program (ICDP) in primary care in Sweden	Case study	International Child Development Program (ICDP)	To improve parental care competence, parent-child interactions and attachment patterns	Unspecified	Primary care	Parents and children aged 0 to 6 years served by health centers	Acceptability, feasibility
Yeasmin et al., 2021[96]	To explore factors affecting attendance, active participation, and adoption of behavioral recommendations in the RINEW intervention package	Qualitative study	Research on Integration of maternal and child nutrition, early childhood development, and water, sanitation, and hygiene (RINEW)	To promote child development through components focused on child stimulation, maternal and child nutrition, mental health, sanitation and prevention of lead exposure	Groups and monthly home visits of unspecified duration	Community health agents	Children < 2 years	Fidelity, acceptability, feasibility, appropriateness, penetration
Yousafzai et al., 2014[97]	To analyze the implementation processes of interventions that integrate nutrition and psychosocial stimulation for children under 5 years of age in low- and middle-income countries	Systematic review	Nutrition and psychosocial stimulation interventions, including 4 delivery strategies: home visits, community group sessions, clinic visits, and large-scale programs	To promote ECD	Weekly or fortnightly interventions, with home visits lasting 30 minutes to 1 hour for 8 weeks in one study and in the others, they ranged from 6 to 36 months. Groups in the community: one or two contacts; and interventions in clinics: 5 to 10 additional minutes during children's consultations	Unspecified	Parents of children under five years of age	Fidelity, acceptability
Yousafzai et al., 2018[98]	To evaluate barriers and facilitators of adoption, quality and fidelity of implementation of the psychosocial stimulation intervention in combination with the enriched nutritional intervention in the National Program for Family Planning and Primary Health Care	Mixed methods study	Pakistan Early Child Development Scale-Up	To integrate a new ECD (responsive stimulation) intervention and strengthen existing nutrition services, which is critical to optimizing development and growth outcomes	Monthly home visits	Women community health workers	Children under 2 years old	Fidelity, acceptability, appropriateness, penetration
Zaidi et al., 2018[99]	To describe facilitators and barriers to multisectoral work on nutrition initiatives aimed at promoting ECD in Pakistan	Mixed methods study	Multisectoral actions in nutrition initiatives aimed at ECD	To promote child well-being	Unspecified	Government bodies, international agencies and other non-governmental agencies	Preschool children	Adoption, incremental cost

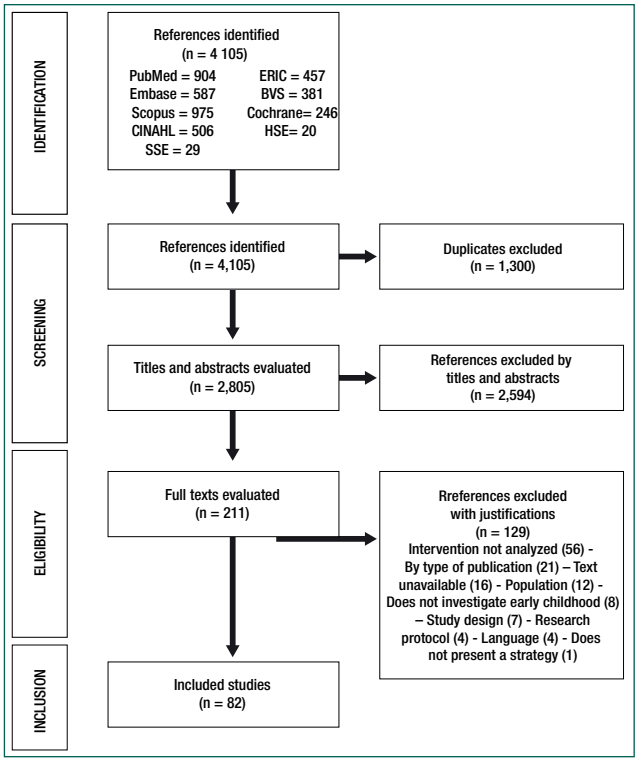

Figure 1. Study selection flowchart

aimed at ECD and 15.6% (n = 13) were aimed at promotion of parenting. In studies that described interventions with more than one objective (n = 25), in 16 the interventions sought ECD in association with practices to promote parenting (n = 7); family development and support (n = 3); nutrition (n = 2); health promotion and conditions (n = 1); implementation of services (n = 1); education and learning (n = 1); and child safety (n = 1). The target population was mainly children (n = 12) and caregivers (n = 12). Of the 82 studies, 73 (89.0%) presented children as direct beneficiaries of the strategies, and in seven (8.6%), other subjects (pregnant women/mothers, caregivers or family members) were the target of the benefits. Those responsible for the interventions were mainly the project team (n = 7), community health agents (CHA) (n = 6), educators (n = 6), managers (n = 5), and health professionals, without specification of the category (n = 5). Most studies (n = 51) did not present data on the duration of interventions. However, data from 16 studies demonstrated an average duration of 14.5 months.

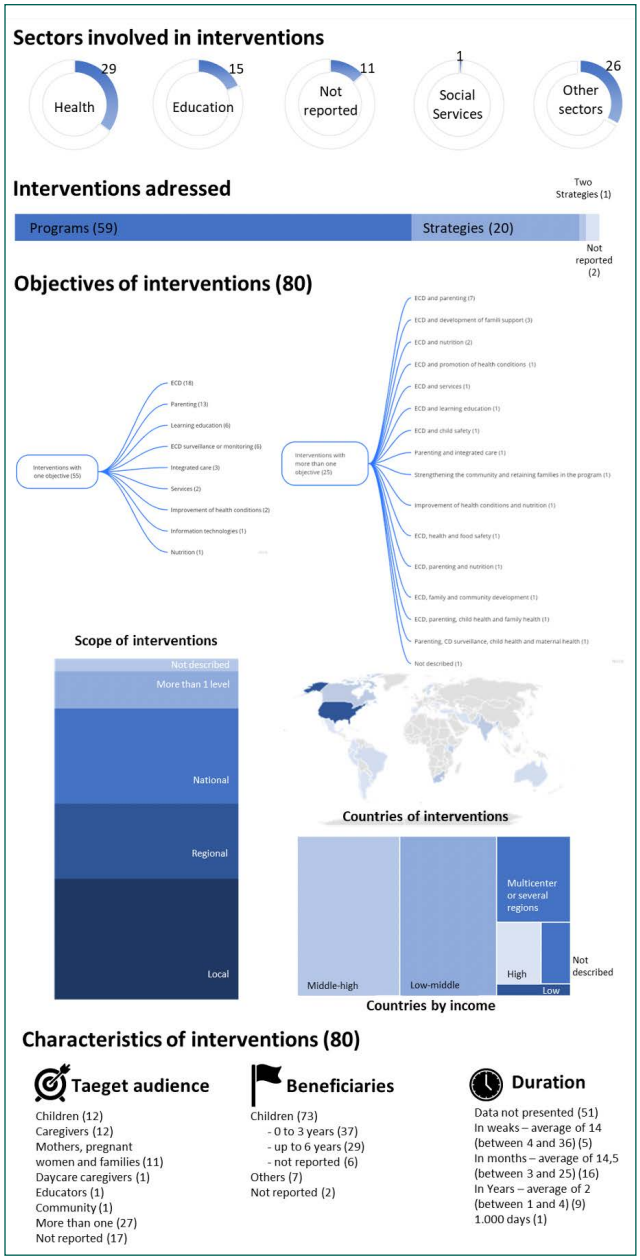

Figure 2. Characteristics of interventions

Characteristics of implementation analysis

Some aspects of the implementation analysis of ECD interventions are highlighted below: the use of frameworks and their objectives, the analysis of implementation strategies and outcomes and the identification of adaptations and equity in the implementation of interventions. Only a quarter of the studies (25.6%) based their methodology on frameworks to analyze the implementation of interventions. In these cases, most developed their own frameworks to support the work with logical mod-

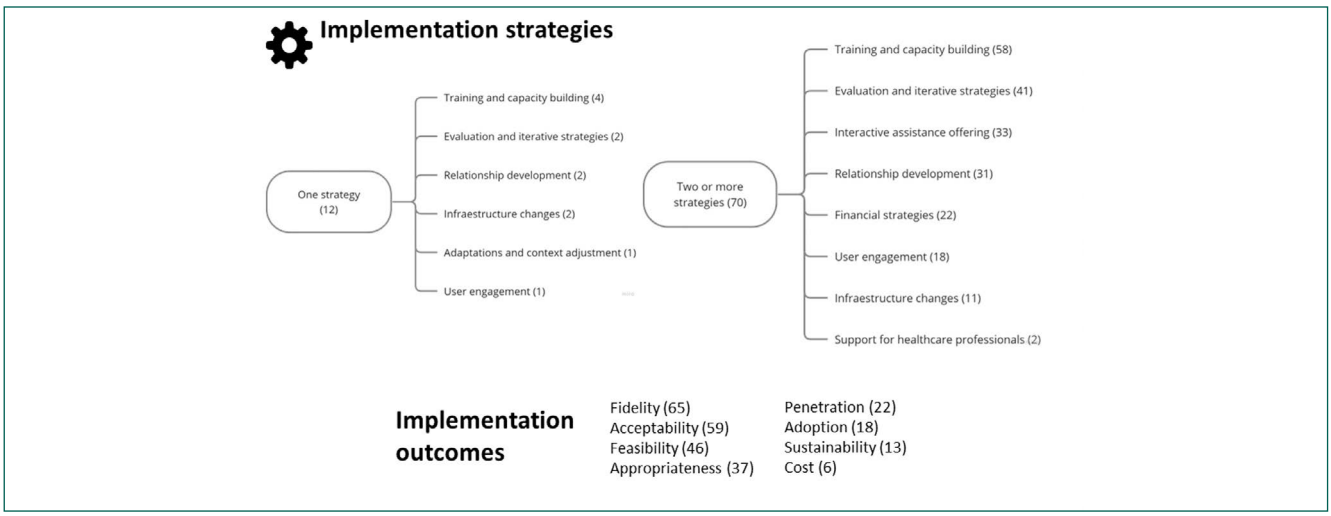

Figure 3. Implementation strategies and outcomes (prepared by the authors).

els and different configurations suited to specific usage needs. Chart 3 describes the main models and theoretical references used in the studies and their objectives. Of the 82 studies analyzed, 12 reported a discrete implementation strategy: use of evaluation and iterative strategies (n = 2); adaptation and adjustment to the context (n = 1); developing stakeholder relationships (n = 2); training and capacity building of interested parties (n = 4); user engagement (n = 1) and infrastructure changes (n = 2). The remaining studies reported multifaceted strategies and the most frequently cited were training and capacity building of interested parties (n = 58) followed by the use of evaluation and iterative strategies (n = 42); adaptation and adjustment to the context (n = 41); offer of interactive assistance (n = 33) and development of relationships between stakeholders (n = 31). In Chart 4 it is possible to identify the most frequently analyzed outcomes, according to the systematization proposal by Proctor et al.[15] Half (n = 41; 50%) of articles analyzed adaptations of interventions or programs. Among the adaptations identified, 13 articles reported adaptations made to the design of the intervention or program before the actions were initiated and another 24 articles discussed some aspects perceived during the implementation process. Aspects of equity related to implementation were cited in 24 studies (29.3%). In some cases, equity concerns were reported without detail when scaling up the intervention. The most frequent characteristics to ensure equity were related to elements of race, ethnicity and culture (13.4%). These characteristics refer, for example, to the need for linguistic adjustments to make actions culturally appropriate. There were recurrent mentions of equity in contexts influenced by socioeconomic aspects (8.5%), gender (6.1%), place of residence (6.1%), general aspects (4.9%) and religious aspects (1.2%) in implementation possibilities (Chart 4).

Discussion

The challenge of ensuring that all children have access to quality early childhood development by 2030 as part of the Sustainable Development Goals emphasizes the need to strengthen and expand the implementation of ECD programs.[100] In this scoping review, we identified the growth in implementation research publications from 2015 onwards, which can guide strategies to overcome the difficulties of the effective implementation process and the adaptation of interventions in different contexts. However, the description of the objectives and research design adopted were quite unclear in several studies, in addition to the lack of foundation in implementation frameworks, which can reduce the comparison between findings and the use of results in other contexts.[101]

Chart 3. Frameworks and models used in the analysis of implementation of ECD interventions among the selected studies

Models and theoretical frameworks	Reference*	Objectives#
RE-AIM	29, 68	To determine the success of implementation through aspects of implementation that can be evaluated
Framework proposed by the National Institutes of Health Behavior Change Consortium (BCC) group	58, 85	To evaluate the fidelity of behavioral treatment interventions
CAS - Complex Adaptive Systems	75, 93	To understand the process of scaling up interventions
STEPPS - Selection, Training, and Evaluation for Effective Program Scaling and Sustainability	91	To support implementation analysis
SABER-ECD - Systems Approach for Better Education Results ECD Analytical Framework	62	To inform the policy when expanding ECD based on: favorable environment, implementing ECD broadly, and monitoring and ensuring quality
MIHOPE - Mother and Infant Home Visiting Program Evaluation	38	To evaluate the effectiveness of home visiting programs funded by the United States federal government
PRECEDE/PROCEED	88	To evaluate the health needs to design, implement, and assess health promotion and other public health programs
Framework by Carroll and collaborators	43	To assess implementation fidelity
Framework by Bowen and collaborators	83	To design feasibility studies
Multiple Streams Framework	21	To understand the policy agenda setting process
Intervention Science Framework for Early Childhood Nurturing Interventions	35	To improve the implementation of interventions and increase the scale of interventions, seeking sustainability
CASEL Guide for Schoolwide Social and Emotional Learning / CASEL's School Theory of Action	63	To support the planning, implementation and monitoring of social-emotional learning at school
Bandura's Social Learning Theory and Wenger and Wenger-Trayner's communities of practice	23	To support the training of subjects to deal with possible impediments. To this end, it presents strategies to make changes: planning, illustrations or experiments, self-control and evaluation procedures
MEL system (monitoring, evaluation and learning)	67	To improve the intervention through learning at all stages: design, implementation and results
Diffusion of innovations theory of Greenhalgh	95	To understand which factors must be achieved in the implementation process (at the micro, meso and macro levels) to ensure the propagation of innovations in health services
Fixsen implementation stages	95	To understand the details of an implementation process (in six stages) in order to reduce the gaps between knowledge and practice
Theory of Change	40	To understand the feasibility of implementation
Framework of Bowen	83	To assess feasibility around the following key elements: implementation and practicality, acceptability, limited effectiveness, and demand
Framework of Ponguta	76	To explore the intervention delivery and evaluation process, covering: context; enrollment; quality of program implementation; care, adherence and perception of maternal engagement; self-reported impacts, including acceptability of program content; and facilitators and barriers to program evaluation
Framework of Paulsell	73	To assess the degree of implementation of each project

Note: *references relating to articles included in the full text. #Objectives for applying theories, models and frameworks according to authors of the selected studies

Chart 4. Implementation outcomes* analyzed in selected studies

Implementation outcome analyzed		Total of studies	References#
Fidelity	Expresses if the intervention is delivered as intended; adherence; integrity and quality in the delivery of the intervention.	65	3, 19, 22, 23, 27-34, 36-38, 41, 43-50, 52-60, 62, 63, 65, 66, 68-70, 72-82, 84, 86, 87, 89-91, 93, 94, 96-98
Acceptability	Satisfaction of those involved (professionals and users) with the intervention.	59	19, 20, 22-25, 27, 29, 31, 32, 34, 35, 38, 40-42, 44, 45, 47, 49-51, 53-59, 61, 63-71, 74, 76, 78-81, 83-89, 93-98
Feasibility	Actual fit or usefulness; suitability for daily use; practicability.	46	21, 23, 24, 26, 30-32, 34, 39, 40, 42, 44, 46, 47, 49-51, 53, 54, 56, 57-61, 63-65, 73, 77-80, 83-87, 89, 91-93, 95, 96
Appropriateness	Perception of those involved about the compatibility, usefulness, practicality and aptness for the intervention.	37	3, 19-22, 24-26, 28, 30, 34, 38-41, 44, 45, 47, 49, 50, 52, 54, 58, 62, 65, 67, 74, 78-80, 83, 87, 96, 98
Penetration	Level of institutionalization, access, accessible service.	22	3, 20, 26, 28-31, 42, 48, 57, 58, 60, 62, 68, 72, 76, 77, 80-82, 96, 98
Adoption	Expresses the capture, use, initial implementation and the intention to try to implement.	18	19, 25, 28-30, 41, 42, 45, 48, 49, 65, 68, 75, 76, 77, 85, 94, 99
Sustainability	Maintenance, continuity, durability, incorporation, integration, institutionalization, routinization, sustained use of the intervention.	13	3, 25, 29, 31, 40, 48, 57, 58, 68, 75, 81, 90,92
Incremental cost	Marginal cost; cost-effectiveness; cost benefit.	6	21, 38, 40, 61, 78, 99

*categorization according to Proctor et al. (2019, reference (15) in text of the original article). #references relating to articles included in the full text.

The scoping review allowed for the analysis of a diverse set of interventions aimed at early childhood. Most programs studied were dedicated to promoting child development and parenting with emphasis on home visiting programs and integration of services aimed at early childhood. To understand the implementation of programs, the fundamental aspects of the intervention, such as duration, frequency and modes of delivery must be reported, which was not frequently observed in the included studies. To this end, the use of checklists such as TIDieR (Template for Intervention Description and Replication) has been recommended, which helps to increase the completeness of reporting on interventions.[102,103]

The observed predominance of interventions in the health sector to the detriment of intersectoral initiatives may reflect implementation challenges associated with fragmented governance structures and lack of coordination between sectors, since intersectoral actions can provide services more efficiently.[57]

In the review process, it was difficult to define and describe implementation strategies solely based on the study reports. We chose to adopt the proposal by Waltz (2015)[17] from the ERIC study for the performance of a strategy categorization exercise. The main strategy used in the programs was the training and capacity building of interested parties, involving conducting ongoing education for those delivering the intervention, distributing educational materials and creating spaces for collaborative learning. The use of iterative evaluation strategies, such as identifying barriers and facilitators, auditing and feedback, and developing a formal implementation plan were also present in half of the studies. The low frequency of use of user engagement strategies, which is fundamental to the success of programs, can be considered a gap.[109]

The classification exercise based on the framework proposed by Proctor and collaborators[15] highlighted fidelity as the main outcome investigated in the studies included, reflecting a concern with the quality of programs. The use of structured curricula or manuals, the training and supervision of those involved in program delivery, and the skills, motivation and acceptance of professionals/delivery agents were factors associated with program fidelity.[97] Program acceptability or satisfaction with the intervention was the second most common outcome in the studies, followed by the feasibility and appropriateness of interventions. The adoption outcomes (uptake or initial implementation), as well as the penetration (degree of diffusion and propagation) of programs were less addressed in the studies.

Two aspects related to the relevance of the implementation context were highlighted. First, the importance of adaptations (at the beginning and during the process) in the adjustment of interventions to local needs without losing sight of quality.[105] Likewise, to increase the scale of interventions, a standardized and at the same time flexible planning is necessary for its success in different contexts.[106,107] Thus, the assessment of the expansion environment, incorporation into existing work practices and cultural adaptation are considered essential to guarantee the quality of the proposal even in difficult scenarios and to enhance the positive results.[28,31,48,95] Secondly, aspects related to equity must be considered in the implementation in order to reach those at greatest risk of not achieving their full development and who can benefit most from these programs.[108,109]

Despite the high volume of publications identified and included in this scoping review, 45% of studies were conducted in high-income countries. Therefore, it is urgent to intensify the research agenda on the topic in other contexts. Other limitations faced during this review were the difficulties in characterizing outcomes and strategies used, since sometimes reference tables were not used to facilitate classification. It was possible to resolve this limitation with the support of consolidated frameworks.[15,17] Furthermore, the scoping review was developed with changes in relation to the initial protocol. Due to the volume of references identified, the gray literature and reference lists of included studies were not searched, and the study protocols were excluded in the selection phase.[110]

Conclusion

This review systematically mapped implementation research, showing its potential to help identify the most appropriate strategies to contexts of programs for ECD promotion, as well as the barriers and facilitators in its implementation. Furthermore, through the analysis of implementation outcomes, it indicates the achievement of the objectives of each of them. As the implementation of these programs is not always preceded by effectiveness studies, the adoption of hybrid designs focusing on implementation and user results is promising. Therefore, the incorporation of results of efforts by various groups of researchers in the field of implementation science in the definition of concepts, strategies and outcomes based on the proposition of frameworks

is essential to "not start from scratch", and improve such tools to the needs of local contexts. We hope the present study will help to incorporate elements of implementation research into the planning, implementation and evaluation processes of programs aimed at ECD in Brazil, thus contributing to reach their objectives and sustainability.

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