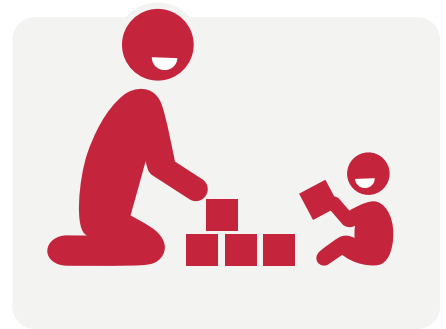


**IMPROVING
EARLY
CHILDHOOD
DEVELOPMENT:**
WHO Guideline



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Improving early childhood development: WHO guideline

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ACRONYMS

BFHI	Baby-friendly Hospital Initiative
BMI	body-mass index
CI	confidence interval
ECD	early childhood development
GDG	Guideline Development Group
GRADE	Grading of Recommendations Assessment, Development and Evaluation methodology
HAZ	height-for-age Z-score
HIC	high-income country
LMIC	low- or middle-income country
MCA	Department of Maternal, Newborn, Child and Adolescent Health and Ageing
MCH	Maternal and child health
MhGAP	Mental Health Gap Action Programme
MSD	Department of Mental Health and Substance Abuse
PICO	population, intervention, comparison, outcome
RCT	randomized controlled trial
SD	standard deviation
SMD	standardized mean difference
WASH	water, sanitation and hygiene
WAZ	weight-for-age Z-score
WHO	World Health Organization
WHZ	weight-for-height (or length) Z-score

GLOSSARY OF TERMS

Attachment	An emotional bond between an infant and one or more adults. The infant will approach these individuals in times of distress, particularly during the phase of infant development when the presence of strangers induces anxiety. In addition, the infant is distressed if separated from attachment figures.
Depression	An affective disorder characterized by a sense of inadequacy, feelings of despondency or hopelessness, a decrease in activity and/or reactivity, pessimism, sadness, irritability, changes in appetite and sleep patterns, and poor concentration.
Developmental potential	Ability to think, learn, remember, relate and articulate ideas appropriate to age and level of maturity.
Early childhood development	Refers to the cognitive, physical, language, motor, social and emotional development between 0 - 8 years of age.
Early learning	Any opportunity for the baby, toddler or child to interact with a person, place or object in their environment, recognizing that every interaction (positive or negative, or absence of an interaction) is contributing to the child's brain development and laying the foundation for later learning.
(Child) Maltreatment	The abuse and neglect of children under 18 years of age. It includes all types of physical and/or emotional ill-treatment, sexual abuse, neglect, negligence and commercial or other exploitation, which results in actual or potential harm to the child's health, survival, development or dignity in the context of a relationship of responsibility, trust or power.
Maternal-infant bonding	A process that includes the emotional tie of a mother to her infant, occurring in the first week or year of an infant's life and that is influenced by signals and cues from the child as well as the maternal-driven processes.
Nurturing care	Characterized by a caregiving environment that is sensitive to children's health and nutritional needs, responsive, emotionally supportive, and developmentally stimulating and appropriate, with opportunities for play and exploration and protection from adversities.
Play	Defined as being for its own sake (without a specific goal), voluntary, a special activity (out of the ordinary), enjoyed by participants, governed by rules (implicit or explicit) and imaginative. It can be solitary or social, and with or without objects. Young children acquire and consolidate developmental skills through playful interactions with people and objects.
Positive parenting	Incorporates anticipatory guidance for safety, education, development and the establishment of a caring and understanding relationship with one's child. Parenting is not limited to biological parents, but extends to guardians or caregivers providing consistent care for the child.
Responsive caregiving	Incorporates anticipatory guidance for safety, education, development and the establishment of a caring and understanding relationship with one's child. Parenting is not limited to biological parents, but extends to guardians or caregivers providing consistent care for the child.
Responsiveness	The capacity of the caregiver to respond contingently and appropriately to the infant's signals.
Stimulation	Sensory information received from interactions with people and environmental variability that engages a young child's attention and provides information; examples include talking, smiling, pointing, enabling and demonstrating, with or without objects.

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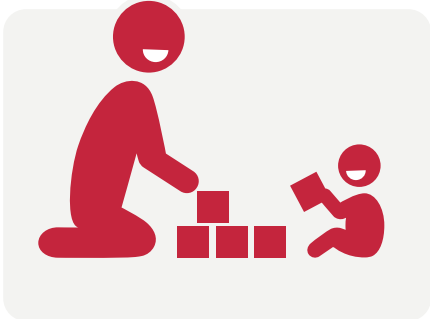
This guideline was coordinated by the World Health Organization (WHO) Departments of Maternal, Newborn, Child and Adolescent Health and Ageing (MCA) and Mental Health and Substance Abuse (MSD). Neerja Chowdhary, Bernadette Daelmans, Tarun Dua and Nigel Rollins oversaw the preparation of this document, as responsible technical officers.

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EXECUTIVE SUMMARY

Enabling young children to achieve their full developmental potential is a human right and an essential requisite for sustainable development. Given the critical importance of enabling children to make the best start in life, the health sector has an important role and responsibility to support nurturing care for childhood development. Many interventions for reproductive, maternal, newborn and child health (including for nutrition, mental health and HIV prevention and care) have a direct impact on child development. Moreover, the health sector has access to families and caregivers during the early childhood period.

Until now, WHO has not had guidelines specifically on improving early childhood development (ECD). Existing WHO guidelines related to neonatal care; infant and young child nutrition; environmental health; prevention and treatment of childhood illnesses; violence and injury prevention; mental health; prevention of noncommunicable diseases; and support for children with developmental difficulties or disabilities, refer to the importance of respective interventions for ECD. However, they do not address ECD-specific interventions such as those related to responsive caregiving and early learning.

PURPOSE OF THE GUIDELINE

This guideline provides global, evidence-informed recommendations on improving ECD. The objective is to identify ECD-specific interventions and feasible approaches that are effective in improving developmental outcomes in children.

The recommendations in this guideline are intended for a wide audience, including policy-makers, development agencies and implementing partners, district and sub-national health managers, health workers and nongovernmental organizations.

GUIDELINE DEVELOPMENT METHODOLOGY

WHO developed these recommendations using the procedures outlined in the *WHO handbook for guideline development* (WHO, 2014a). The steps in this process include: (i) identification of key questions and outcomes; (ii) retrieval of the evidence; (iii) assessment and synthesis of the evidence; (iv) formulation of recommendations, including research priorities; and planning for (v) dissemination; (vi) implementation, equity and ethical considerations; and (vii) impact evaluation and updating of the guideline. The Grading of Recommendations Assessment, Development and Evaluation (GRADE)¹ methodology was followed to prepare evidence profiles related to preselected topics, based on up-to-date systematic reviews.

¹ GRADE (www.gradeworkinggroup.org).

The scoping of the guideline and the prioritization of the outcomes were carried out by the GDG in September 2017. The development and finalization of the evidence-informed recommendations were conducted by the GDG, initially in a meeting held in Geneva, Switzerland, 1 – 3 May 2018, and subsequently in a virtual meeting in September 2018.

AVAILABLE EVIDENCE AND REVIEW PROCESS

The evidence to inform development of the guideline was obtained from two systematic reviews that were conducted following the procedures of the *WHO handbook for guideline development* (WHO, 2014a). The design of the review protocols was informed by the Lancet series *Advancing early childhood development: from science to scale* (Lancet, 2017).

A decision-making framework was used by the GDG to guide discussions and decision-making. This included the following considerations: (i) the quality of the evidence across outcomes deemed critical to decision-making; (ii) the balance of benefits and harms; (iii) values and preferences related to the recommended intervention in different settings and for different stakeholders, including the populations at risk; (iv) the acceptability of the intervention among key stakeholders; (v) resource implications for programme managers; (vi) equity; and (vii) the feasibility of implementation of the intervention. Additional evidence was solicited for these areas where possible.

RECOMMENDATIONS

In order to improve early childhood development, WHO recommends:

1 RESPONSIVE CAREGIVING

All infants and children should receive responsive care during the first 3 years of life; parents and other caregivers should be supported to provide responsive care.

Strength of recommendation: Strong

Quality of evidence: Moderate (for responsive care)



2 PROMOTE EARLY LEARNING

All infants and children should have early learning activities with their parents and other caregivers during the first 3 years of life; parents and other caregivers should be supported to engage in early learning with their infants and children.

Strength of recommendation: Strong

Quality of evidence: Moderate (for early learning)



3 INTEGRATE CAREGIVING AND NUTRITION INTERVENTIONS

Support for responsive care and early learning should be included as part of interventions for optimal nutrition of infants and young children.

Strength of recommendation: Strong

Quality of evidence: Moderate



4 SUPPORT MATERNAL MENTAL HEALTH

Psychosocial interventions to support maternal mental health should be integrated into early childhood health and development services.

Strength of recommendation: Strong

Quality of evidence: Moderate



RESEARCH GAPS

The GDG noted the limited evidence available and prioritized specific knowledge areas for further research. These areas are listed later in the guideline.

PLANS FOR UPDATING THE GUIDELINE

The WHO Steering Group will continue to follow research developments in the area of interventions to improve ECD. After five years, or if significant new evidence emerges before then or there are concerns that one or more recommendations in the guideline may no longer be valid, relevant WHO departments will coordinate a guideline update.



INTRODUCTION

BACKGROUND

Enabling young children to achieve their full developmental potential is a human right and a critical requisite for sustainable development. Evidence in the Lancet series *Advancing early childhood development: from science to scale* (Lancet, 2017) highlights the profound benefits of investing in ECD for learning, productivity, health and social cohesion along the life course. The series highlighted the critical importance of the early years and coined the term 'nurturing care' as a central tenet of what is required to achieve optimal development, namely health, nutrition, security and safety, responsive caregiving and opportunities for early learning.

The *Nurturing Care Framework* for early childhood development (WHO, UNICEF & World Bank Group, 2018) was launched at the World Health Assembly in 2018 to provide a roadmap for action. The *Framework* builds on state-of-the-art evidence about how child development outcomes are influenced and how they can be improved by policies and interventions. Nurturing care is characterized by a stable environment that promotes health and optimal nutrition, protects children from threats, and gives them opportunities for early learning, through affectionate interactions and relationships (Figure). It describes how a whole-of-government and a whole-of-society approach can promote nurturing care for young children and outlines guiding principles, strategic actions and ways of monitoring progress. The *Framework* focuses on the period from pregnancy to age 3 within a life-course approach and addresses all relevant sectors, but with a spotlight on the health sector.

ECD refers to the process of cognitive, physical, language, temperament, socioemotional and motor development of children that starts at the time of conception until 8 years of age. The earliest years are especially important, being the time when the brain develops rapidly; it is therefore a critical period for the fetus and child to receive nurturing care. It is also the period when the fetus and child are most sensitive to interventions (Lancet, 2017). Being at the forefront of providing nurturing care, parents and other primary

caregivers need to be supported through policies and services in order to have knowledge, skills, time and material resources for appropriate child care.

Figure: Components of nurturing care



Given the critical importance of enabling children to make the best start in life, the health sector has an important role and responsibility to support nurturing care. Many interventions for reproductive, maternal, newborn and child health (including for nutrition, mental health and HIV prevention and care) have a direct impact on ECD. Moreover, the health sector has access to families and caregivers during this period and therefore has specific opportunities.

Until now WHO has not had guidelines specifically on interventions for improving ECD. Many existing WHO guidelines related to reproductive, maternal, newborn and child health (including for nutrition, caregiver mental health, HIV prevention and care, and prevention of noncommunicable diseases), refer to the importance of early childhood development. However, they do not

address ECD-specific interventions such as those related to responsive caregiving and early learning opportunities.

In order to provide clear and specific guidance on approaches for improving ECD, MCA in collaboration with MSD developed this guideline with a particular focus on caregiving, opportunities for early learning and communication, and improving the mental health of mothers. The guideline provides global, evidence-informed recommendations on approaches to improve ECD.

SCOPE

The broad aim of this guideline is to improve ECD.

The objectives are to:

- i. identify ECD-specific interventions that are effective in improving developmental outcomes in children;
- ii. identify effective, feasible approaches to deliver interventions to improve ECD.

The guideline prioritizes aspects of child health for which there are presently no WHO recommendations focussed on ECD-specific interventions. It will facilitate consideration of policy and investments, as well as daily care practices to promote and support ECD in households and communities. It will also inform the development of indicators that can be used for monitoring national and sub-national tracking of programmes with responsibility for delivering interventions to improve ECD.

RELEVANT WHO GUIDELINES AND TOOLS THAT SUPPORT ECD

WHO recommendations for improving infant and child health are included in a range of guidelines, tools and training materials. Many of these are relevant for improving ECD. Areas of child health and public health for which WHO guidelines are relevant include neonatal care; infant and young child nutrition; environmental health; prevention and treatment of childhood illnesses; violence and injury prevention; prevention of obesity and promotion of physical activity; caregiver mental health; and support for children with developmental difficulties or disability.

These are grouped in seven categories (see the following list). A fuller description of each is included in [Annex 1](#).

- a. Infant and young child feeding
- b. Responsive caregiving and opportunities for early learning
- c. Antenatal, pregnancy care and delivery
- d. Violence and injury prevention and support for children with disability
- e. Mental health
- f. Environmental health
- g. Neonatal care and the prevention and treatment of severe morbidity in young children
- h. Diet, physical activity and health

POPULATION OF INTEREST

This guideline focuses on interventions and approaches toward infants and children less than 3 years of age and their parents and caregivers.

KEY QUESTIONS

Key questions were developed by the GDG. They reflect areas for inquiry to inform policy and programme needs of Member States and partners. Questions were framed using the population, intervention, comparison, outcome (PICO) format. (See [Annex 2](#)).

- I. What is the effectiveness of responsive caregiving interventions in the first 3 years of life on ECD?
- II. What is the effectiveness of caregiving interventions that promote early learning in the first 3 years of life on ECD?
- III. What is the effectiveness of caregiving interventions to support socioemotional and behavioural development in the first 3 years of life on ECD?
- IV. What is the effectiveness of integrated caregiving and nutrition interventions in the first 3 years of life on ECD and child growth outcomes?
- V. What is the role of supporting maternal mental health as a key influence on ECD outcomes?

OUTCOMES OF INTEREST

The following outcomes were considered as part of the guideline decision-making process and varied according to each key question. The GRADE evidence profiles and systematic reviews provide detail on which outcomes were deemed critical or important for respective questions.

Critical outcomes for the respective questions were selected from:

- child development (cognitive, language, socioemotional and motor);
- responsive caregiving activities, including stimulation and play;
- provision of early learning opportunities (including play-based learning);
- parenting practices (including guidance on safety, education and development);
- behaviour management practices (including routine praise and appropriate discipline);
- anxiety and emotional difficulties;
- child growth (height and weight, including low birth weight).

Outcomes that were important, but not critical for decision-making, were selected from:

- problem behaviour;
- exclusive breastfeeding;
- care-seeking for childhood illnesses;
- rate of childhood illnesses;
- depressive symptom severity;
- adverse effects (including tolerability);
- cost;
- child mortality;
- anxiety symptom severity.

TARGET AUDIENCE

This guideline is directed at:

Development agencies and implementing partners:

To guide maternal and child health (MCH) care programmes and other related sectors with respect to the provision of services and linkages to improve ECD

District and sub-national health managers:

To guide MCH care programmes with respect to the provision of services to improve ECD

Health workers:

To guide end-users regarding expectations for providing services to improve ECD

Nongovernmental agencies:

To guide MCH care programmes with respect to the provision of services to improve ECD

Policy-makers:

To inform national policies and programmes for promoting health, growth and development regarding what is needed to effectively improve ECD

PERSONS AFFECTED BY THE RECOMMENDATIONS

This guideline directly affects all parents and primary caregivers of infants and young children.



GUIDELINE DEVELOPMENT PROCESS

This guideline was developed in accordance with the evidence-informed guideline development methods described in the *WHO handbook for guideline development* (WHO, 2014a). The process included: identification of priority questions and outcomes; retrieval of evidence, assessment and synthesis of the evidence; formulation of recommendations; and planning for the implementation, dissemination, impact evaluation and updating of the guideline.

WHO STEERING GROUP

The WHO Steering Group that guided the entire guideline development process comprised WHO staff members from the Departments of MCA; MSD; Disability, Violence and Injury Prevention; HIV/AIDS; Nutrition for Health and Development; Public Health, Environmental and Social Determinants of Health; Immunization, Vaccines and Biologicals; and Reproductive Health and Research (see [Annex 3](#) for the list of members). Regional advisors from WHO regions also participated in the process. The Steering Group drafted the initial scope of the guideline; identified individuals to be invited to participate as the guideline methodologist and as members of the systematic review teams, the members of the GDG and the External Review Group; supervised the evidence retrieval and synthesis; organized the GDG meeting and subsequent teleconferences; drafted recommendations; and finalized and published the guideline document. The Steering Group will oversee dissemination of the guideline.

GUIDELINE DEVELOPMENT GROUP

The GDG included experts, programme implementers and civil society representatives from the WHO regions (see [Annex 4](#) for the list of members). The members reviewed available information regarding the number of children failing to achieve their developmental potential, the range of interventions proven to improve ECD outcomes and the status of programmes promoting and supporting ECD.

SYSTEMATIC REVIEW TEAMS

Two groups were commissioned to conduct systematic reviews relevant to the key questions identified during the scoping meeting:

1. Department of Global Health and Population, Harvard T.H. Chan School of Public Health, Boston, Massachusetts, United States.
2. Human Development Research Foundation, Rawalpindi, Pakistan, together with University of Liverpool, Liverpool, United Kingdom; School of Public Health and Preventive Medicine, Monash University, Melbourne, Victoria, Australia; CMH Lahore Medical College and Institute of Dentistry, Lahore Cantt, Pakistan.

The systematic reviews were presented at the GDG meeting in Geneva, Switzerland, 1 – 3 May 2018. The GDG requested additional analyses that were incorporated into updated versions of both systematic reviews. The revised reviews were considered at a virtual meeting (teleconference) of the GDG on 17 September 2018. They were then finalized in November 2018. The list of systematic review authors is presented in [Annex 5](#).

The discussions around each of the key questions, from evidence to recommendations, were assisted by the GRADE methodologist.

MANAGEMENT OF CONFLICTS OF INTERESTS

The Steering Group, in compliance with the WHO Guidelines for Declarations of Interests for WHO experts (see **Annex 6**), managed the potential conflicts of interests. All potential GDG members were asked to fill in and sign the standard WHO declaration of interests and confidentiality undertaking forms.

At the meeting, each individual participant verbally stated the interests reported in the written declarations submitted in advance. The group determined that no participant had a conflict of interest that needed management.

IDENTIFICATION OF KEY QUESTIONS AND OUTCOMES

MCA and MSD jointly convened a virtual meeting of the GDG in September 2017 in order to scope the content of the proposed guideline, formulate the key questions and determine the critical outcomes. The report of a multi-stakeholder technical consultation that was convened by WHO in August 2017 – *Operationalizing Nurturing Care* – at which more than 70 representatives of programme implementers, donors, United Nations agencies and national governments participated, was considered at the scoping meeting. The participants also noted the evidence summarized in the 2017 Lancet series (Lancet, 2017).

The GDG prioritized five areas for development of recommendations to improve ECD outcomes:

1. responsive caregiving;
2. increasing play and opportunities for early learning;
3. interventions to support socioemotional and behavioural development;
4. integrated nutrition and responsive caregiving interventions; and
5. supporting maternal mental health.

The GDG considered the available evidence and relevance of each area to different geographical and health system contexts. The group also acknowledged the importance of areas such as nutrition and environmental health, including WASH, to establishing environments that are conducive to ECD.

The GDG recognized that terms such as ‘responsive caregiving’ and ‘nurturing care’ are used among programme implementers and researchers but are not formally included in WHO recommendations. The importance of promoting and supporting ECD among children caught up in emergency settings was also noted.

With respect to the timing of interventions and the period at which outcome measures were assessed for impact, the GDG prioritized interventions in the first 3 years of life even though outcomes may only be measured at 5 years, e.g. school attainment.

QUALITY ASSESSMENT AND GRADING OF EVIDENCE

The systematic reviews based on the review questions were used to summarize and appraise the evidence. The results of the systematic reviews were presented to the GDG, along with an assessment of the confidence in the estimates of effect for the critical outcomes.

Evidence profiles were prepared according to the GRADE approach, to assess the overall quality of the evidence. The evidence for each outcome was rated as “high”, “moderate”, “low”, or “very low”, based on a set of criteria including risk of bias, inconsistency, imprecision, indirectness and publication bias.

The evidence-retrieval process for the priority questions followed the standard outlined in the *WHO handbook for guideline development* (WHO, 2014a), as follows:

- I. Commission systematic reviews. The WHO Steering Group reviewed the questions identified and commissioned two systematic reviews. A protocol for each review was developed by expert review teams that included search terms and a strategy according to the inclusion and exclusion criteria for the PICO's defined (**Annex 2**).
- II. The quality assessment of the evidence was performed according to GRADE considering study design (randomized controlled trial [RCT] or observational studies), risk of bias, inconsistency, indirectness, imprecision and risk of reporting bias.
- III. Review teams were asked to provide their assessment of the quality of evidence. At the time of the GDG meeting and a subsequent teleconference, the GDG members were also asked to indicate their confidence in the evidence based on the following criteria:

Quality	Definition	Implications
High	The GDG is very confident that the true effect lies close to that of the estimate of the effect	Further research is very unlikely to change confidence in the estimate of effect
Moderate	The GDG is moderately confident in the effect estimate: the true effect is likely to be close to the estimate of the effect, but there is a possibility that it is substantially different	Further research is likely to have an important impact on confidence in the estimate of effect and may change the estimate
Low	Confidence in the effect estimate is limited: the true effect may be substantially different from the estimate of the true effect	Further research is very likely to have an important impact on confidence in the estimate of effect and is unlikely to change the estimate
Very low	The group has very little confidence in the effect estimate: the true effect is likely to be substantially different from the estimate of the effect	Any estimate of effect is very uncertain

The reviews and meta-analyses are available as online annexes:

 www.who.int/maternal_child_adolescent/guidelines/SR_Caregiving_interventions_ECD_Jeong_Final_Nov2018.pdf?ua=1

 www.who.int/maternal_child_adolescent/guidelines/SR_Psych_Therapeutic_interventions_ECD_Rahman_Final_Sept2018.pdf?ua=1

QUALITY OF EVIDENCE

The overall degree of confidence in the estimates of effect as presented in the GRADE profiles was considered in the drafting of the recommendation. The higher the quality of evidence across critical outcomes that are relevant to decision-making, the higher the likelihood was of a clear positive recommendation. A context-specific recommendation was likely to be warranted when the overall quality was rated “low” or “very low”.

MANAGING GROUP PROCESSES AND DECISION-MAKING

The chairperson was nominated at the opening of the May 2018 consultation in Geneva, and the nomination was approved by the GDG. A methodologist co-chaired and was present during most of the meeting to support the decision-making processes.

The procedures for decision-making were established at the beginning of the consultation, including a minimal set of rules for agreement and documentation of decision-making. Deliberations among the members of the GDG took place until consensus was reached. A decision was made that if there were no consensus, a positive vote of about 75% (10 out of 13 members) of the GDG would be required for approval of the proposed recommendation. However, in the course of the GDG meeting, it was not necessary to apply this rule.

The systematic reviews and the GRADE evidence profiles were used for drafting recommendations. An evidence-to-decision framework was used to lead discussion and decision-making. The GDG reviewed the evidence and discussed the draft recommendations taking into consideration: (i) the quality of the evidence across outcomes deemed critical to decision-making; (ii) the balance of benefits and harms; (iii) values and preferences related to the recommended intervention in different settings and for different stakeholders, including the populations at risk; (iv) the acceptability of the intervention among key stakeholders; (v) resource implications for programme managers; (vi) equity; and (vii) the feasibility of implementation of the intervention. Additional evidence and experiences contributed to the discussions of (ii) to (vii).

DOCUMENT PREPARATION AND EXTERNAL PEER REVIEW

The responsible technical officer working with a consultant wrote the first draft of the guideline.

The draft guideline was peer-reviewed by content experts in order to: provide technical feedback; identify errors of fact; ensure that there were no important omissions, contradictions or inconsistencies with scientific evidence or programmatic feasibility; and assist with clarifying the language, especially in relation to implementation, adaptation and contextual issues. The independent peer reviewers were selected by the Steering Group. Six potential peer reviewers were approached after assessment of the declarations of interests, and four provided reviews (listed in Acknowledgements).

The Steering Group reviewed all comments and revised the document, in order to ensure clarity of the recommendations while maintaining consistency with the original meaning.

Technical editing and proofreading were carried out by a contracted party.

PRESENTATION OF THE RECOMMENDATIONS

The discussion points around each of the key questions are presented, covering the following contents:

- summary of evidence from systematic reviews for each of the questions;
- summary of considerations for determining the direction and strength of the recommendations, which includes:
 - quality of evidence;
 - balance of benefits and harms;
 - values and preferences (of pregnant women and mothers);
 - acceptability (to health workers, lay or peer counsellors);
 - resource implications;
 - equity;
 - feasibility.
- at the end of each section, a short summary brings together:
 - the recommendation;
 - the rationale;
 - additional remarks for consideration in implementing the recommendations.

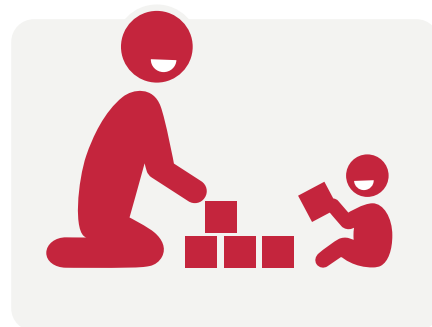
Three options for the type of recommendation were agreed by the GDG, namely:

1. Strong: communicates that the recommendation is based on the confidence that the desirable effects of adherence to the recommendation outweigh the undesirable consequences;
2. Context-specific recommendation (recommended only in specific contexts);
3. Not recommended.

The GDG also reserved the option of making no recommendation.

In presenting the summary of evidence from systematic reviews for each of the interventions, standardized statements of effects were used for different combinations of the magnitude of effect and the quality of evidence (assessed using GRADE). See [Annex 7](#) for evidence profiles.

In the GDG discussions, the relevance of the acceptability and feasibility of recommendations to the end user (decision-makers, health care providers, health service users and end-beneficiaries) and also cost and equity considerations were assessed qualitatively rather than on statistical significance.





EVIDENCE AND RECOMMENDATIONS

Two systematic reviews, based on the key questions for improving ECD, provided the evidence for the recommendations:

- *Caregiving interventions to support early child development in the first three years of life: report of the systematic review of evidence* (Jeong, Franchett & Yousafzai, 2018).

www.who.int/maternal_child_adolescent/guidelines/SR_Caregiving_interventions_ECD_Jeong_Final_Nov2018.pdf?ua=1

This review addressed key questions I – IV (see [pages 14-27](#)) and additional analysis.

- *Psychotherapeutic interventions for common maternal mental health problems among women to improve early childhood development in low- and middle-income countries: report of systematic review and meta-analysis of RCTs* (Rahman et al., 2018).

www.who.int/maternal_child_adolescent/guidelines/SR_Psych_Therapeutic_interventions_ECD_Rahman_Final_Sept2018.pdf?ua=1

This review addressed key question V (see [pages 28-30](#)).

The reviews followed the procedures of the *Cochrane handbook for systematic reviews of interventions* (Higgins & Green, 2011). Details of the search strategies undertaken and the methodologies employed are given in the reviews.

Different tools were used in each of the studies to evaluate both childhood development and caregiving outcomes. These are detailed in the respective systematic reviews.

The descriptions of the different types of interventions considered in the reviews are given in [Table 1](#).

Table 1: Intervention types considered in the evidence/guideline review

Intervention focus	Description and type of interventions	Types of interventions not considered
Responsive caregiving	<p>These interventions target the caregiver-child dyad to promote responsive caregiver-child interactions and strengthen the parent-child relationship. They encourage and support sensitivity and responsiveness (care that is prompt, consistent, contingent, and appropriate to the child's cues, signals, behaviours and needs) or secure attachment. Interventions that improve caregivers' abilities to incorporate the child's signals and perspective can be undertaken in the context of, but not limited to, play and communication or feeding. They include, but are not limited to, facilitating the caregiver to be attuned to and identify the child's needs and wants, to follow the child's lead, help the child to focus, support the child's exploration and scaffold development.</p>	<ul style="list-style-type: none"> • Interventions that relate to caregiving more generally, but without a primary focus on promoting positive caregiver-child interactions. • Interventions that focus on infant and young child feeding or exclusive breastfeeding, without an emphasis on responsiveness between caregiver and child. • Interventions that exclusively target caregivers (e.g. through provision of information or education), rather than targeting the caregiver-child dyad to facilitate and encourage quality caregiver-child interactions. • Interventions that focus exclusively on the child.
Early learning and development	<p>Interventions that enhance caregivers' access, knowledge, attitudes, practices or skills with respect to supporting early learning and development for young children. These interventions may either: a) directly support caregivers in providing new early learning opportunities for their children; or b) build caregiver capacities more generally, providing information and guidance around healthy newborn/child development or a range of nurturing care topics. Interventions may incorporate aspects of responsive caregiving or behaviour management, but the overall goals and activities of interventions to support early learning are broader in scope. Interventions may be supplemented by messages about a variety of different caregiving topics but must include messaging around early learning and development. Intervention goals that relate to caregiving, but are not clearly specified, are also categorized as general caregiving interventions. Specific examples may include:</p> <ul style="list-style-type: none"> • Interventions to promote caregiver-child book readings or book sharing. • Interventions that provide learning and play materials, such as book gifting or developmentally appropriate toys, to increase opportunities for early learning. • Interventions that promote general caregiving competencies to support early learning and development in young children. These interventions primarily focus on and support caregivers themselves, as opposed to enhancing the caregiver-child relationship. Examples include caregiver group meetings to share information and discuss caregiving issues; home-visiting programmes to improve caregiver knowledge of ECD and caregiving skills; or informational sessions providing general advice on caregiving covering discipline, routines, feeding and child health and development. 	<ul style="list-style-type: none"> • Interventions that focus on supporting the needs of caregivers and families, but do not include a specific objective to support caregiving skills for promoting early learning and child development. • Interventions that focus on reproductive, maternal, newborn and child health, but do not include a specific objective to support caregiving skills for promoting child development. • Interventions that are specifically focused on particular aspects of caregiving (e.g. only behaviour management, only responsive caregiving).

Intervention focus	Description and type of interventions	Types of interventions not considered
Caregiving to support healthy socioemotional and behavioural development	<p>Interventions that support caregivers in promoting healthy socioemotional and behavioural development for young children and preventing child behaviour problems or child maltreatment. This includes encouraging caregivers to use appropriate and desirable practices, including sensitive discipline and limit-setting; reducing inappropriate behaviour management practices, such as harsh discipline and coercion; or some combination. Positive parenting and behaviour management interventions encourage stable and healthy family relationships and provide for the physical and emotional safety of the child to promote positive behavioural development outcomes for young children. Examples include:</p> <ul style="list-style-type: none"> • interventions promoting positive behaviour management techniques, such as establishing daily routines, praise and appropriate discipline. • interventions reducing child maltreatment and associated factors, such as harsh punishment. 	<ul style="list-style-type: none"> • Interventions related to caregiving more generally, in which behaviour management or child behavioural development is not the primary focus. • Interventions intended to promote early learning opportunities. • Interventions where the primary goal is secure attachment and supportive sensitive and responsive interactions between caregivers and children more broadly.
Combined caregiving and nutrition interventions	<p>Interventions that combine a caregiving component with a nutrition component such as:</p> <ul style="list-style-type: none"> • caregiving component: interventions that enhance caregivers' access, knowledge, attitudes, practices or skills with respect to supporting caregiving (responsive caregiving, caregiving to support early learning, healthy socioemotional and behavioural development for young children); • nutrition component: may include breastfeeding promotion, agricultural or nutrition education or provision of a macronutrient or micronutrient supplement. 	<ul style="list-style-type: none"> • Interventions that contain only caregiving components or only nutrition components. • Interventions that do not assess a child development outcome. • Interventions that promote nutrition through agriculture only (e.g. livestock, crops). • Interventions that promote WASH only.
Psychosocial maternal mental health interventions	<p>These interventions target maternal mental health conditions (i.e. depression and anxiety). The most commonly employed strategies include psychoeducation; cognitive behavioural therapy; interpersonal psychotherapy; and other strategies such as participatory learning, social support, aerobic exercise and music therapy; or a combination of strategies.</p> <p>In addition, interventions for early childhood health and development include elements of parent-child interaction, communication skills, nutrition, caregiver coping, social support and behavioural contracting, and these also impact on maternal mental health outcomes.</p>	<ul style="list-style-type: none"> • No specific exclusions.

KEY QUESTION I

What is the effectiveness of responsive caregiving interventions in the first 3 years of life on ECD?

Summary of evidence

A total of 17 studies² reporting responsive caregiving interventions for caregivers and their children during the first 3 years of life were identified. The majority were conducted in high-income countries (HICs). All programmes focused on engaging mothers and their children, while the dosage and duration of programmes ranged from a shorter intervention delivered in weekly sessions over 2.5 months to a longer intervention delivered over three years.

ECD outcomes³

Cognitive development: Three studies assessed programme impact on cognitive development. Only one (Mendelsohn et al., 2007), presented the unadjusted means and standard deviations (SDs) which could be extracted for the analysis, and results indicated that the impact on cognitive development was null (standardized mean difference [SMD] = 0.26, 95% confidence interval [CI]: -0.14, 0.66; $n^4 = 1$). The certainty of evidence was graded as low.

Language development: Five studies evaluated intervention impacts on language development using different tools. The pooled results showed no significant impacts (SMD = 0.08, 95% CI: -0.07, 0.23; $n = 5$). The certainty of evidence was graded as moderate.

Motor development: Two programmes evaluated impact on motor development, but only one (Frongillo et al., 2017) presented unadjusted means and SDs to calculate the effect size, and results indicated an improvement in motor development (SMD = 0.19, 95% CI: 0.12, 0.26; $n = 1$). The certainty of evidence was graded as moderate.

Socioemotional development: Four studies evaluated the impact on socioemotional development, and the pooled results showed no significant effect (SMD = 0.14, 95% CI: -0.03, 0.30; $n = 4$). The certainty of evidence was graded as low.

Behaviour problems: Seven studies assessed impact on behaviour problems. The pooled results showed no significant effect on reducing problems (SMD = -0.14, 95% CI: -0.29, 0.002; $n = 7$). The overall certainty of evidence was graded as low.

Attachment: Seven studies evaluated the impact of responsive caregiving interventions on attachment outcomes. Pooled results indicated no impacts on attachment outcomes (SMD = 0.13, 95% CI: -0.11, 0.37; $n = 3$).⁵ Four studies could not be included in the pooled results of which three similarly reported null effects while one reported significant improvement in attachment outcomes (Cooper et al., 2009). The overall certainty of evidence was graded as low.

Height-for-age Z-score (HAZ) and weight-for-age Z-score (WAZ): One study evaluated the impact on HAZ and WAZ (Frongillo et al., 2017), and found a positive effect on improving HAZ (SMD = 0.10, 95% CI: 0.03, 0.16; $n = 1$). The overall certainty of evidence on HAZ was graded as moderate. This study found no significant effect on improving WAZ (SMD = 0.03, 95% CI: -0.04, 0.10; $n = 1$). The overall certainty of evidence on WAZ was graded as moderate.

Caregiving outcomes

Caregiving knowledge: The results of one study showed no impact on caregiving knowledge (SMD = 0.29, 95% CI: -0.01, 0.58; $n = 1$). The overall certainty of evidence was graded as low.

Caregiving practices: Three programmes evaluated impacts on caregiving practices; the pooled results showed no impacts (SMD = 0.53, 95% CI: -0.10, 1.17; $n = 2$).⁵ The overall certainty of evidence was graded as low.

² All studies reported in the guideline were RCTs or cluster-RCTs unless otherwise indicated.

³ For some ECD domains, it was difficult to ascertain an outcome score due to the assessment tool used, the degree of adaptation/modification to any tool or other limitations in the data. In reporting the effects of interventions, priority was given to certain components of that outcome: for child language, receptive language was prioritized over expressive language. Children typically develop receptive language skills first, and this is especially important in the age group of interest, i.e. 0-3 years; for child motor development, fine motor development was selected over gross motor development, because there is evidence of an association between fine motor skills in early life and subsequent learning and development).

⁴ n refers to number of studies included in the meta-analysis.

⁵ The number of studies contributing to the effect size is fewer than the number of studies that reported measuring the outcome due to some studies only reporting the effect qualitatively or providing a significance level for an outcome, or not presenting the data required to estimate the effect size.

Caregiver-child interactions: The pooled results from eight programmes showed a significant improvement in the quality of caregiver-child interactions (SMD = 0.34, 95% CI: 0.15, 0.54; n = 6). The overall certainty of evidence was graded as low.

Caregiver depressive symptoms: Impact on caregiver depressive symptoms was evaluated in three studies. The pooled results showed that interventions significantly reduced symptoms (SMD = -0.21, 95% CI: -0.39, -0.04; n = 3). The overall certainty of evidence was graded as moderate.

Subgroup analyses

Subgroup analyses were conducted to examine possible moderating effects by HICs versus low- or middle-income countries (LMICs) for outcomes for which it was feasible (Table 2). Only two studies from LMICs had quantitative data available for the analysis. The limited data sets suggest the direction of the effect is generally consistent between HICs and LMICs.

Table 2: Child and caregiver outcomes for interventions that implement responsive caregiving only, by HICs versus LMICs

Outcome	HICs			LMICs		
	SMD	95% CI	N	SMD	95% CI	N
Child outcomes						
Language development	0.00	-0.15, 0.15	4	0.23	0.16, 0.30	1
Attachment	0.16	-0.10, 0.43	2	0.00	-0.53, 0.53	1
Caregiver outcomes						
Caregiving practices	0.21	-0.19, 0.61	1	0.86	0.45, 1.28	1
Caregiver-child interactions	0.32	0.07, 0.58	4	0.46	-0.06, 1.00	2
Caregiver depressive symptoms	-0.17	-0.56, 0.23	1	-0.22	-0.42, -0.03	2

Additional meta-analyses requested by the GDG

During the May 2018 GDG meeting, and following presentation and discussion of the systematic review *Caregiving interventions to support early child development in the first three years of life: report of the systematic review of evidence*, the GDG requested the review team to conduct additional analyses. The GDG noted:

- Studies had been categorized into those that implemented: i.) responsive caregiving interventions; or ii.) early learning interventions. Studies were then included in the meta-analysis of only one intervention type.
- The GDG concluded that the available evidence did not permit disaggregation of the effects of responsive caregiving interventions from those of early learning interventions.
- It was difficult to clearly differentiate studies that only implemented responsive caregiving interventions from those that implemented only early learning interventions because insufficient information was provided in publications to determine whether/how each was implemented.

The GDG therefore agreed to limit key question I to interventions that were solely responsive caregiving and key question II to interventions that were solely early learning. However, the GDG requested that the systematic review team conduct complementary analyses to evaluate the combined effect of both interventions on ECD outcomes.

The GDG also made suggestions related to studies that reported several outcome measures for any ECD domain, i.e. language or mother domain. The GDG recommended that studies that had been excluded because they recruited low-birth-weight infants or those with specific disabilities should be included. It also recommended that studies with fewer than 85 subjects that had been excluded from the review should be included.

After the meeting, the systematic review team updated the protocol which was then reviewed and agreed by the GDG chairs and a sub-group identified by the GDG. The systematic review team completed the analyses in early September 2018, and shared them with the GDG prior to a virtual meeting that was convened on 17 September 2018.

Based on the updated analyses, the GDG reviewed and formulated recommendations for key questions I and II. Additional description of the decision-making process is provided below.

Summary of the considerations of the members of the GDG for determining the direction and strength of the recommendation

A recommendation was formulated, informed by the evidence presented and with explicit consideration of the factors listed next.

Certainty of evidence

Responsive caregiving improved ECD and caregiver outcomes. The overall certainty of evidence was rated as **Moderate**.

Balance of benefits and harms

The studies demonstrated benefits to children and caregivers, while harmful impacts were not found.

Long-term outcome data are not available, so it is difficult to equate early benefits with long-term effects. It was also noted that early interventions may be helpful but not sufficient for long-term gains. With current data, assumptions regarding the long term cannot be made.

In a study in a humanitarian crisis setting, responsive care benefitted maternal mood and improved caregivers' involvement with their infants.

Values and preferences

Several qualitative studies have reported that parents and caregivers value interventions that support their children's development and learning (e.g. Gladstone et al., 2018; Jain et al., 2018). In these studies, the value of early ECD outcome is perceived to be important for educational achievement. Therefore, responsive caregiving is likely highly valued, if overall ECD is considered. However, individual outcomes, e.g. responsiveness, may not be equally valued.

The overall value of ECD outcomes is not presently linked to outcomes several years later, limiting the value attributed.

Acceptability

Qualitative reports note acceptability of interventions, interest in topics, and perceived benefits by caregivers and delivery agents. This appears to be also true for high-risk populations, based on other WHO guidelines and statements (see **Annex 1**, in particular **section c.**).

Black and colleagues (2017) reported increased investment since 2010 available for programmes that support ECD, and increasing numbers of countries with national policies and/or strategies for ECD, indicating acceptability in the form of national engagement and demand for interventions.

Resource implications

The limited available evidence indicates that interventions are cost-effective and therefore favours implementation. Gowani and colleagues (2014) reported the cost of a responsive caregiving intervention integrated in an existing health service in Pakistan as US\$ 48 per child per year. However, the available data are not equated with outcomes.

High variability in costs depends on delivery mechanisms, whether they are integrated into existing platforms and the quality of those delivery platforms. In LMICs, community health worker and primary health care facilities were the platforms for implementation. In settings where home visiting services or community groups do not already exist or where resources are not being adequately allocated for ECD, such interventions are likely to increase costs.

Potential cost efficiencies might be found if interventions are integrated in existing health (or other sector) platforms (Richter et al., 2017).

The financial and societal cost of inaction is also a factor, as well as the long-term returns on investment in the early years (Campbell et al., 2014; Gertler et al., 2014). Children at elevated risk for compromised development due to stunting and poverty are likely to forgo about one quarter of average adult income per year, and the cost of inaction to gross domestic product can be double what some countries currently spend on health (Richter et al., 2017).

Equity

Implementing responsive caregiving interventions will be likely to reduce the inequalities that exist in countries with regards to access to resources and programmes that promote ECD. Many of the interventions target at-risk disadvantaged families/communities. From evidence in other WHO guidelines (see **Annex 1**), when interventions are delivered to high-risk populations, e.g. those at risk of violence or abuse of children, they tend to increase equity.

Equity in delivery will depend on the service platform and extent of targeting of the highest risk groups. Gender inequities regarding which caregiver is the focus of interventions and implications for work and other livelihood issues should be considered.

Feasibility

Responsive caregiving interventions are probably feasible to implement, but it depends on the context and resources committed to a programme. Responsive caregiving has been implemented in a range of contexts and platforms (i.e. groups, individualized home visits, primary health care contacts) and can be delivered by trained lay workers.

The specificities of reported programmes are uncertain, but most will require strategies to address system-level potential and readiness (e.g. workforce development, training, supervision, monitoring and evaluation, governance, leadership).

RECOMMENDATION 1

WHO recommends:

- All infants and children should receive responsive care during the first 3 years of life;
- Parents and other caregivers should be supported to provide responsive care.

Strength of recommendation: Strong; Certainty of evidence: Moderate (for responsive care)

Rationale

The recommendation reflects the evidence demonstrating the efficacy of interventions for responsive caregiving for improving several domains of ECD. The GDG considered that the second part of the recommendation, i.e. that parents and caregivers should be supported, was an important and logical implication that warranted being explicitly stated. In formulating the recommendation and determining its strength, the GDG, in addition to the evidence for efficacy of interventions, also took into account the discussions and available literature on other factors mentioned above, particularly those on values and preferences and acceptability.

Remarks

A challenge in the literature is the wide application of definitions of responsive caregiving – a component of nurturing care - which have not been consistently operationalized in studies. Also, the GDG acknowledged some overlap in differentiating interventions for responsive caregiving and early learning. The additional analyses combining interventions as requested by the GDG acknowledged the overlap across intervention strategies, its representativeness, and its potential to improve outcomes.

While general conclusions can be drawn about the impact of interventions to improve ECD, the key question did not ask whether a specific caregiving intervention had greater or lower effects on ECD than another. Furthermore, studies were not designed to address this question. Any comparisons of caregiving interventions should be interpreted with caution given the range of definitions and the variation in the implementation approaches.

The ability to measure the outcomes of responsive caregiving early in life is limited, as it relies on mostly parent-report tools. Gains in this area may emerge later in life and are thought to be important for sustained impacts in other areas.

KEY QUESTION II

What is the effectiveness of caregiving interventions that promote early learning in the first 3 years of life on ECD?

Summary of evidence

The evidence for caregiving interventions to promote early learning is derived from 22 RCTs, the majority conducted in HICs. Most programmes targeted the mother or other female primary caregiver. Interventions were delivered to families individually through home visitations, were group-based or a mix of individual and group-based delivery strategies, and programme duration ranged from 1.5 to 60 months. The studies on caregiving to support early learning indicate these are promising interventions with modest effects found on child cognition, motor development and attachment. Evidence for effectiveness on caregiving outcomes was not observed in the pooled data.

ECD outcomes³

Cognitive development: Thirteen studies assessed programme impact on cognitive development. The pooled results indicate positive impacts of caregiving interventions (SMD = 0.20, 95% CI: 0.01, 0.39; n = 8). The overall certainty of evidence was graded as low.

Language development: Pooled results from nine studies indicated that interventions had no significant impact on language development (SMD = 0.07, 95% CI: -0.11, 0.24; n = 6). The overall certainty of the evidence was graded as low.

Motor development: Seven studies evaluated effects on motor development. The pooled results showed positive effects (SMD = 0.32, 95% CI: 0.12, 0.52; n = 5). The overall certainty of the evidence was low.

Socioemotional development: Nine studies assessed programme impacts on socioemotional development. Pooled results showed positive effects (SMD = 0.28, 95% CI: 0.09, 0.48; n = 3). However, there were non-significant differences in five out of six other studies that could not be meta-analysed. The overall certainty of the evidence was graded as very low.

Behaviour problems: Eight programmes evaluated impact on behaviour problems. The pooled results showed no significant effect on reducing problems (SMD = -0.25, 95% CI: -0.54, 0.04; n = 3). In the five studies that could not be meta-analysed, the evidence was mixed: three studies found reductions in children's behaviour problems and two found no significant differences. The overall certainty of evidence was graded as very low.

Attachment outcomes: Two studies assessed impacts on attachment outcomes, but only one study (Guedeney et al., 2013) contributed to the effect size estimate. Results indicated significant positive impacts on attachment outcomes (SMD = 0.30, 95% CI: 0.09, 0.51; n = 1). The overall certainty of evidence was graded as low.

HAZ and WAZ: The pooled results from two studies showed no effects on child HAZ outcomes (SMD = -0.02, 95% CI: -0.29, 0.24; n = 2). The overall certainty of the evidence was graded as moderate. The pooled results showed no effects on child WAZ outcomes (SMD = 0.05, 95% CI: -0.10, 0.19; n = 2). The overall certainty of the evidence was graded as moderate.

Caregiving outcomes

Caregiving knowledge: Two of three impact evaluations reported significant improvements in caregiving knowledge, while one study found no programme effects. Unadjusted means and SDs were not presented in the papers, and therefore it was not possible to calculate a pooled estimate. The overall certainty of the evidence was graded as low.

Caregiving practices: Impacts on caregiving practices were assessed in eight studies, and only one found improvements. Pooled results indicated no programme impacts (SMD = 0.05, 95% CI: -0.04, 0.13; n = 2). The overall certainty of evidence was graded as low.

Caregiver-child interactions: Three of five studies that evaluated intervention impacts on caregiver-child interactions reported positive impacts, while two studies reported no impacts. It was not possible to calculate a pooled estimate as the studies did not present the unadjusted means and SDs. The overall certainty of evidence was rated as low.

³ For some ECD domains, it was difficult to ascertain an outcome score due to the assessment tool used, the degree of adaptation/modification to any tool or other limitations in the data. In reporting the effects of interventions, priority was given to certain components of that outcome: for child language, receptive language was prioritized over expressive language. Children typically develop receptive language skills first, and this is especially important in the age group of interest, i.e. 0-3 years; for child motor development, fine motor development was selected over gross motor development, because there is evidence of an association between fine motor skills in early life and subsequent learning and development).

Caregiver depressive symptoms: Four studies assessed programme impacts on caregiver depressive symptoms. The pooled results showed no effect on symptoms (SMD = 0.07, 95% CI: -0.08, 0.22; n = 2). The overall certainty of evidence was graded as moderate.

Subgroup analyses

Subgroup analyses were conducted to examine possible moderating effects by HICs versus LMICs. Results are presented in **Table 3**. The impact on ECD and caregiver mental health appears greater in LMICs; however, more studies measuring this outcome in both HICs and LMICs are required as findings are drawn from only one study in each context.

Table 3: Child and caregiver outcomes for interventions that promote early learning and development, by HICs versus LMICs

Outcome	HICs			LMICs		
	SMD	95% CI	N	SMD	95% CI	N
Child outcomes						
Cognitive development	0.08	-0.02, 0.18	5	0.32	-0.11, 0.75	3
Language development	0.03	-0.09, 0.15	4	0.30	-0.67, 1.27	2
Motor development	0.08	-0.10, 0.26	1	0.39	0.17, 0.60	4
Caregiver outcomes						
Caregiver depressive symptoms	0.13	-0.11, 0.37	1	0.03	-0.16, 0.22	1

Additional meta-analyses requested by the GDG

See **page 15** for information on additional analyses and conclusions.

Summary of the considerations of the members of the GDG for determining the direction and strength of the recommendation

A recommendation was formulated, informed by the evidence presented and with explicit consideration of the factors listed next.

Certainty of evidence

The certainty of the evidence ranged from very low to moderate.

With respect to caregiver outcomes, instruments used to assess knowledge and practices varied widely and were generally not standardized. Overall, few psychometric properties were reported about the assessment tools used with respect to reliability and validity (particularly when implemented in different sociocultural contexts).

Balance of benefits and harms

There were no indications of adverse effects caused by interventions to support development and early learning. Significant (modest) impacts were found on child cognitive and motor development.

The size of impact may vary based on the dosage and quality of the implemented programme, and risk exposures for the target population. Only limited studies have examined programme characteristics such as dosage.

Some RCTs show interventions improve the home learning environment (Ertem et al., 2007).

Values and preferences

Several qualitative studies have reported that parents and caregivers value interventions that support their children's development and learning (e.g. see special series in Annals of the New York Academy of Sciences on Implementation Research and Practice for ECD [Yousafzai et al., 2018]). In these studies, the value of ECD is perceived to be important for educational achievement.

Acceptability

Qualitative data report acceptability of interventions, interest in topics, and perceived benefits by caregivers and delivery agents. This appears to be true for high-risk populations also, based on other WHO guidelines and statements.

As for responsive caregiving, Black and colleagues (2017) reported increased investment available for programmes that support ECD since 2010, and increasing numbers of countries with national policies and/or strategies, indicating acceptability in the form of national engagement and demand for interventions.

Resource implications

Costing data for interventions supporting early learning were not readily available in the literature.

It was noted that the cost of inaction should also be considered, as well as the long-term returns on investment in the early years (Campbell et al., 2014; Gertler et al., 2014).

Equity

Implementing support for early learning will likely reduce inequalities in opportunities for children to develop their full potential.

Many of the interventions implemented target at-risk disadvantaged families/communities. From evidence in other WHO guidelines (see **Annex 1**), when interventions are delivered to high-risk populations, e.g. those at risk of violence or abuse of children, they tend to increase equity.

Feasibility

It appears to be feasible to implement early learning interventions. Caregiver engagement in early learning has been implemented in a range of contexts and platforms (i.e. groups, individualized home visits) and can be delivered by lay workers.

RECOMMENDATION 2

WHO recommends:

- All infants and children should have early learning activities with their parents and other caregivers during the first 3 years of life;
- Parents and other caregivers should be supported to engage in early learning with their infants and children.

Strength of recommendation: Strong; Quality of evidence: Moderate (for responsive care)

Rationale

The recommendation reflects the evidence which demonstrates the efficacy of interventions for early learning for improving several domains of ECD. The GDG considered that the second part of the recommendation, i.e. that parents and caregivers should be supported, was an important and logical implication that warranted being explicitly stated. In formulating the recommendation and its strength, the GDG, in addition to the evidence for efficacy of interventions, also took into account the discussions and available literature on other factors mentioned above, particularly those on values and preferences and acceptability.

Remarks

A challenge in the literature is the wide application of definitions of early learning – components of nurturing care - which have not been consistently operationalized in studies. The additional analyses combining interventions as requested by the GDG acknowledged the overlap across intervention strategies, their representativeness, and their potential to improve outcomes.

While general conclusions can be drawn about the impact of interventions to improve ECD, the key question did not ask whether a specific caregiving intervention had greater or lower effects on ECD than another. Furthermore, studies were not designed to address this question. Any comparisons of caregiving interventions should be interpreted with caution given the range of definitions and the variation in the implementation approaches.

KEY QUESTION III

What is the effectiveness of caregiving interventions to support socioemotional and behavioural development in the first 3 years of life on ECD?

Summary of evidence

Ten studies with caregiving interventions to support healthy socioemotional development and behaviour for children during the first 3 years of life were identified, all conducted in HICs.

ECD outcomes

Socioemotional development: Only one study assessed socioemotional development. No significant effects were found (adjusted mean difference in intervention group versus control scores: SMD = 0.04; $p = 0.09$; adjusted effect size = 0.14). The certainty of evidence was graded as very low.

Child behaviour: Ten studies evaluated child behaviour. The pooled results showed no effect on reductions in child behaviour problems (SMD = -0.02, 95% CI: -0.07, 0.02; $n = 5$).⁵ The certainty of evidence was graded as moderate.

Cognitive development: Only one study assessed cognitive development. Mean scores for intervention group children were significantly higher compared to children in the control group ($p < 0.05$) (Caldera et al., 2007). Authors indicated an adjusted mean effect size of 0.29. The certainty of evidence was graded as very low.

Motor development: One study assessed motor development (Caldera et al., 2007). Authors presented an adjusted mean effect size of 0.19, although the difference between groups was not statistically significant ($p = 0.16$). The certainty of evidence was graded as very low.

Child health: Two studies examined impact on indicators for child health and medical outcomes. Caldera and colleagues (2007) showed significant improvements in the number of families with health care coverage for the child, but no effects on immunizations, receipt of well-child visits, incidence of injuries requiring medical care, or number of hospitalizations and emergency department visits. Fergusson and colleagues (2005) found effects on children being up-to-date on well-child visits, experiencing fewer hospitalizations for accidents and injuries, and having higher rates of preschool dental services enrollment, but no effects were observed on immunization rates. Child health outcomes were not commonly or consistently measured across studies; therefore, data on child health could not be meta-analysed.

Caregiving outcomes

Caregiving knowledge: Two studies assessed impact on caregiving knowledge. Caldera and colleagues (2007) found no significant effects on maternal knowledge, while a study by Barlow and colleagues (2015) observed significant improvements in caregiving knowledge among intervention mothers. The certainty of evidence was graded as very low.

Caregiving practices: Eight studies examined impacts on caregiving practices. The pooled results showed no effect (SMD = 0.01, 95% CI: -0.04, 0.06; $n = 2$).⁵ The certainty of evidence was graded as low.

Caregiver-child interactions: Five studies assessed effects on caregiver-child interactions. The pooled results showed no significant effect on improving caregiver-child interactions (SMD = 0.14, 95% CI: -0.07, 0.34 $n = 1$).⁵ The certainty of evidence was graded as very low.

Child maltreatment: Two studies assessed impacts on child maltreatment. Neither observed significant effects. One study examined parental report of contact with the New Zealand Early Start Program for issues relating to child abuse and neglect (Fergusson et al., 2005) but did not see reductions in agency contacts. The other (Jacobs et al., 2016) examined records from Healthy Families Massachusetts to assess whether substantiated child maltreatment reports had been filed, but also did not observe any significant effects.

Caregiver mental health: Four studies assessed intervention impact on caregiver mental health. The pooled results showed no effect on reductions in maternal depressive symptoms (SMD = -0.05, 95% CI: -0.11, 0.01; $n = 3$). The certainty of evidence was graded as low.

Self-efficacy: Three studies assessed impact on caregiver self-efficacy. Caldera and colleagues (2007) and Breitenstein and colleagues (2012) found intervention group mothers to have significantly higher reported self-efficacy scores compared to control groups; however, Gross and colleagues (2009) found no effects. The certainty of evidence was graded as low.

⁵ The number of studies contributing to the effect size is fewer than the number of studies that reported measuring the outcome due to some studies only reporting the effect qualitatively or providing a significance level for an outcome, or not presenting the data required to estimate the effect size.

Subgroup analyses

Subgroup analyses were conducted to examine possible moderating effects by intended intervention intensity (infrequent contacts or for less than three months versus regular contacts and longer than three months) and delivery method (individual versus group-based/mixed contacts). None of the pooled effect sizes on child and caregiver outcomes differed significantly by intensity or delivery. Statistical power to detect differences in subgroups is limited due to the small number of studies for many of the caregiver and child outcomes.

Summary of the considerations of the members of the GDG for determining the direction and strength of the recommendation

The GDG, with the support of the Steering Group, was informed by the evidence presented and explicit consideration of the factors listed next.

Certainty of evidence

The certainty of the evidence found was considered to be **Very Low**.

With respect to caregiver outcomes, instruments used to assess knowledge and practices varied widely and were generally not standardized. Overall, few psychometric properties were reported about the assessment tools used with respect to reliability and validity (particularly when implemented in different sociocultural contexts).

Balance of benefits and harms

There were no indications of adverse effects caused by caregiving interventions to support child socioemotional and behavioural development, and the review found small impacts on ECD and caregiving outcomes.

RECOMMENDATION

The GDG declined to make a recommendation, but prioritized the area for a future research process.

Rationale

While the GDG considered this an important area, the group could not make a recommendation on the basis of the available evidence.

Values and preferences

The GDG considered it likely that parents and caregivers would value these outcomes.

Acceptability

The GDG considered that the interventions were probably acceptable.

Resource implications

There is limited evidence on costs. One study from Australia reported mean costs of AUS\$ 218 (AUS\$ 10 from each family and AUS\$ 208 from the government) for a general programme, increasing to AUS\$ 682 (AUS\$ 166 per family and AUS\$ 516 from government) for a general programme with targeting for high-risk families (Hiscock et al., 2018).

Equity

Equity would probably increase if interventions in this area were implemented, especially if delivered to high-risk populations.

Feasibility

It appeared feasible to the GDG to implement this type of intervention, especially for high-risk populations. However, the specific details of how reported programmes were implemented, which affect feasibility, are uncertain.

Remarks

The global evidence on caregiving interventions to support children's socioemotional wellbeing and behaviour during the first 3 years of life comes solely from HICs. Therefore, these findings cannot be generalized to LMICs.

KEY QUESTION IV

What is the effectiveness of integrated caregiving and nutrition interventions in the first 3 years of life on ECD and child growth outcomes?

- What are the independent and additive effects of caregiving and nutrition interventions on ECD and child growth outcomes in the first 3 years of life?
- Do the effects on ECD and child growth outcomes differ between programmes that are targeted for young children with moderate to severe malnutrition compared to general programmes?

Summary of evidence

A total of 18 combined caregiving and nutrition interventions delivered to caregivers and their young children during the first 3 years of life were identified. All 18 studies were conducted in LMICs.

The evidence from general populations in LMICs indicates that combined caregiving and nutrition interventions are effective for improving child cognitive, language and motor development compared with usual care, and for improving child cognitive and language development compared with nutrition alone. No significant benefits were observed on growth outcomes. Among malnourished populations, combined caregiving and nutrition interventions were effective for improving child cognitive, language and motor development compared with usual care, and on child cognitive development compared with nutrition alone.

Early child outcomes (general population - LMICs)

Cognitive development

- For combined nutrition and caregiving interventions versus standard of care, the pooled results showed an improvement in cognitive development (SMD = 0.57, 95% CI: 0.32, 0.82; n = 14). The certainty of evidence was graded as low.
- For combined nutrition and caregiving versus caregiving interventions alone, the pooled results showed no significant improvement in cognitive development (SMD = 0.10, 95% CI: -0.12, 0.32; n = 6). The certainty of evidence was graded as low.
- For combined nutrition and caregiving versus nutrition interventions alone, the pooled results showed a significant improvement in cognitive development (SMD = 0.45, 95% CI: 0.22, 0.67; n = 9). The certainty of evidence was graded as low.

Language development

- For combined nutrition and caregiving interventions versus the standard of care, the pooled results showed a significant improvement in language development (SMD = 0.40, 95% CI: 0.17, 0.63; n = 10). The certainty of evidence was graded as low.
- For combined nutrition and caregiving versus caregiving alone, the pooled results showed no significant improvement in language development (SMD = 0.01, 95% CI: -0.09, 0.10; n = 6). The certainty of evidence was graded as moderate.
- For combined nutrition and caregiving versus nutrition alone, the pooled results showed a significant improvement in language development (SMD = 0.21, 95% CI: 0.13, 0.28; n = 6). The certainty of evidence was graded as moderate.

Motor development

- For combined nutrition and caregiving interventions versus the standard of care, the pooled results showed a significant improvement in motor development (SMD = 0.4, 95% CI: 0.26, 0.53; n = 10). The certainty of evidence was graded as low.
- For combined nutrition and caregiving versus caregiving alone, the pooled results showed no significant improvement in motor development (SMD = 0.18, 95% CI: -0.06, 0.42; n = 6). The certainty of evidence was graded as low.
- For combined nutrition and caregiving versus nutrition alone, the pooled results showed a significant improvement in motor development (SMD = 0.14, 95% CI: 0.06, 0.22; n = 9). The certainty of evidence was graded as high.

Socioemotional development

- For combined nutrition and caregiving interventions versus the standard of care, the pooled results showed no significant improvement in socioemotional development (SMD = 0.09, 95% CI: -0.11, 0.30; n = 2). The certainty of evidence was graded as low.
- For combined nutrition and caregiving versus caregiving alone, Yousafzai and colleagues (2014) found no significant effect (SMD = 0.11, 95% CI: -0.04, 0.26). The certainty of evidence was graded as low.
- For combined nutrition and caregiving versus nutrition alone, Yousafzai and colleagues (2014) reported a non-significant effect (SMD = -0.09, 95% CI: -0.24, 0.07). The certainty of evidence was graded as low.

HAZ

- For combined nutrition and caregiving interventions versus the standard of care, the pooled results showed no significant effect (SMD = -0.13, 95% CI: -0.31, 0.05; n = 9). The certainty of evidence was graded as low.
- For combined nutrition and caregiving versus caregiving alone, the pooled results showed no significant effect (SMD = -0.21, 95% CI: -0.60, 0.19; n = 4). The certainty of evidence was graded as low.
- For combined nutrition and caregiving versus nutrition alone, the pooled results showed no significant effect (SMD = -0.42, 95% CI: -0.85, 0.01; n = 4). The certainty of evidence was graded as low.

WAZ

- For combined nutrition and caregiving interventions versus the standard of care, the pooled results showed no significant effect (SMD = 0.06, 95% CI: -0.02, 0.13; n = 7). The certainty of evidence was graded as high.
- For combined nutrition and caregiving versus caregiving alone, the pooled results showed no significant effect (SMD = 0.07, 95% CI: -0.04, 0.17; n = 3). The certainty of evidence was graded as moderate.
- For combined nutrition and caregiving versus nutrition alone, the pooled results showed no significant effect (SMD = 0.06, 95% CI: -0.02, 0.14; n = 4). The certainty of evidence was graded as moderate.

Weight-for-height (or length) z-score (WHZ)

- For combined nutrition and caregiving interventions versus the standard of care, the pooled results showed significant benefits (SMD = 0.20, 95% CI: 0.05, 0.34; n = 6). The certainty of evidence was graded as moderate.
- For combined nutrition and caregiving versus caregiving alone, the pooled results showed significant benefits (SMD = 0.16, 95% CI: 0.03, 0.29; n = 4). The certainty of evidence was graded as moderate.
- For combined nutrition and caregiving versus nutrition alone, the pooled results showed significant benefits (SMD = 0.17, 95% CI: -0.04, 0.38; n = 5). The certainty of evidence was graded as low.

Impact on other child nutrition and child health outcomes

Child nutrition and health outcomes have not been commonly or consistently measured together across studies. Evidence from individual studies found improvements in the intervention groups for some indicators, while three studies found no effects on reducing illness (Aboud et al., 2013; Menon et al., 2016; Singla et al., 2015), and another study found reductions in diarrhoea and acute respiratory illness (with or without responsive caregiving and early learning) (Yousafzai et al., 2014).

Subgroup analyses

The interventions were analysed by whether they were directed specifically toward malnourished children compared with universal implementation when interventions were implemented to all children in the community without reference to their anthropometric status (no targeting). In each comparison, the effect size for development outcomes were higher for malnourished children than the universally-implemented studies, with mixed results on growth outcomes. (See **Tables 4, 5 and 6**).

Table 4: Combined responsive caregiving and early learning versus standard of care

Outcome	Overall			Targeted: malnourished			Universal		
	SMD	95% CI	N	SMD	95% CI	N	SMD	95% CI	N
Cognitive development	0.57	0.32, 0.82	13	0.63	0.34, 0.92	6	0.52	0.15, 0.88	7
Language development	0.40	0.17, 0.63	10	0.56	0.32, 0.81	3	0.35	0.07, 0.63	7
Motor development	0.40	0.26, 0.53	10	0.38	0.13, 0.64	5	0.41	0.25, 0.58	5
Attachment	–	–	–	–	–	–	–	–	–
Socioemotional development	0.09	-0.11, 0.30	1	–	–	–	–	–	–
HAZ	-0.13	-0.31, 0.05	9	-0.36	-0.88, 0.15	2	-0.07	-0.25, 0.11	7
WAZ	0.06	-0.02, 0.13	7	0.00	-0.14, 0.14	2	0.08	-0.01, 0.17	5
WHZ	0.20	0.05, 0.34	6	0.11	-0.10, 0.31	3	0.25	0.04, 0.46	3

Table 5: Combined responsive caregiving and early learning versus caregiving alone

Outcome	Overall			Targeted: malnourished			Universal		
	SMD	95% CI	N	SMD	95% CI	N	SMD	95% CI	N
Cognitive development	0.10	-0.12, 0.32	6	0.32	-0.03, 0.66	4	-0.13	-0.24, -0.02	2
Language development	0.01	-0.09, 0.10	6	0.26	-0.12, 0.63	2	-0.01	-0.11, 0.09	4
Motor development	0.18	-0.06, 0.42	6	0.42	-0.26, 1.09	3	0.06	-0.14, 0.25	3
Attachment	–	–	–	–	–	–	–	–	–
Socioemotional development	0.11	-0.04, 0.26	1	–	–	–	–	–	–
HAZ	-0.21	-0.60, 0.19	4	-0.83	-1.19, -0.46	1	0.00	-0.25, 0.25	3
WAZ	0.07	-0.04, 0.17	3	0.00	-0.15, 0.15	1	0.12	-0.02, 0.27	2
WHZ	0.16	0.03, 0.29	4	0.09	-0.19, 0.38	2	0.18	0.03, 0.32	2

Table 6: Combined responsive caregiving and early learning versus nutrition alone

Outcome	Overall			Targeted: malnourished			Universal		
	SMD	95% CI	N	SMD	95% CI	N	SMD	95% CI	N
Cognitive development	0.45	0.22, 0.67	9	0.61	0.18, 1.05	6	0.23	0.13, 0.33	3
Language development	0.21	0.13, 0.28	6	0.43	-0.20, 1.07	2	0.21	0.15, 0.27	4
Motor development	0.14	0.07, 0.22	9	0.07	-0.16, 0.30	4	0.17	0.11, 0.23	6
Attachment	–	–	–	–	–	–	–	–	–
Socioemotional development	-0.08	-0.24, 0.07	1	–	–	–	–	–	–
HAZ	-0.42	-0.85, 0.01	4	-1.28	-1.65, -0.91	1	-0.14	-0.41, 0.14	3
WAZ	0.06	-0.02, 0.14	4	0.15	-0.00, 0.31	1	0.04	-0.03, 0.10	3
WHZ	0.17	-0.04, 0.38	5	0.13	-0.14, 0.40	2	0.20	-0.09, 0.48	3

Summary of the considerations of the members of the GDG for determining the direction and strength of the recommendation

The GDG formulated a recommendation informed by the evidence presented and with explicit consideration of the factors listed next.

Quality of evidence

The certainty of evidence across different outcomes varied from **Low** to **High**. Overall, the certainty of evidence was considered **Moderate**.

Balance of benefits and harms

In the review, benefits to children's development were found (especially those at risk from undernutrition), while harmful impacts were not found. Some GDG members were concerned that some countries are now beginning to have a problem of children becoming overweight, and this should be taken into account.

The group found that the evidence favours the intervention, but the intervention varied considerably in different studies. The size of the benefits varied, but all were consistent in a positive direction.

Values and preferences

The GDG considered there was no important variability in values and preferences. Families perceive value in 'whole-child' approaches (DiGirolamo et al., 2014).

Acceptability

These interventions appear to be acceptable, although there was some concern over the ability of the health services to absorb additional tasks. For example, in the context of HIV, integration of interventions with general MCH interventions has been difficult to achieve due to competing demands on time and the ability of staff to take on additional tasks.

Black and colleagues (2017) reported increased investment since 2010 available for programmes that support ECD and increasing numbers of countries with national policies and/or strategies for ECD, indicating acceptability in the form of national engagement and demand for interventions.

Nabarro (2013) sees nutrition-sensitive programmes (including parenting/caregiving) as an important part of the solution to solving child nutrition challenges.

Resource implications

The cost of interventions (including additional costs of combining new interventions with existing services) was not reported in the studies. Potential cost savings for programmes may be possible when using the same platform and delivery agent to provide integrated nurturing care for children (DiGirolamo et al., 2014; Hurley, Yousafzai & Lopez-Boo, 2016). However, the cost of any added nutritional commodities needs to be taken into account, while at the same time long-term savings of children being healthy warrant consideration.

Equity

Members of the group expressed the opinion that the interventions would probably increase equity, but it depends on how they are targeted and delivered. A focus is needed on populations that are at risk of malnutrition and other social determinants of poverty. A reduction in inequalities is likely if common pathways to malnutrition and inadequate caregiving are tackled (Grantham-McGregor et al., 2007; Black & Dewey, 2014).

The interventions could increase inequity if services are provided only to the high-resource groups that are more likely to access services.

Feasibility

The group concluded that it was probably feasible to implement the interventions. The co-delivery of this type of intervention has been demonstrated, even in low-resource and refugee settings (Morris et al., 2012),

when the required system and other support is provided. However, implementation could dilute other work of, for example, community health workers. It would be feasible if other support were provided, as it depends on health worker time, support and supervision.

Qualitative synthesis of implementation processes on integration of interventions comprising nutrition and caregiving is available (Yousafzai & Aboud, 2014).

Subgroup analyses

The interventions were analysed by whether they targeted malnourished children compared with universal implementation (no targeting). In each comparison, the effect sizes for benefit in development outcomes are higher for malnourished children than for children in the universally implemented studies, and there are mixed results on growth outcomes.

RECOMMENDATION 3

WHO recommends:

- **Support for responsive care and early learning should be included as part of interventions for optimal nutrition of infants and young children.**

Strength of recommendation: Strong; Quality of evidence: Moderate

Rationale

The GDG took into consideration the evidence and discussions. The factors above were, in addition, taken into consideration during the deliberations for this key question. For example, interventions have been shown to be acceptable and likely to increase equity.

Combined nutrition and responsive caregiving interventions benefit child development outcomes compared to the standard of care or nutrition alone. Impacts are greater when malnourished populations are targeted. Both responsive caregiving and early learning activities are relevant and important for ECD.

Responsive feeding and play are already important components of rehabilitation care for malnourished children. As such, emphasizing the opportunity to support caregivers in providing responsive care and early learning to children at risk of, or being treated for, malnutrition seems appropriate and consistent with their nutritional care.

The lack of improvement of nutritional outcomes may reflect limitations of the interventions or other constraints, e.g. clinical conditions related to individual children.

No studies were retrieved combining caregiving and over-nutrition meeting the specified inclusion criteria in the initial search.

Remarks

Responsive feeding is a part of responsive caregiving and is essential to adequate nutrition. The child needs both to thrive, and nutrition interventions alone are not enough to improve child development.

Nutrition interventions alone do not appear adequate to have an impact on ECD, but they do appear to do so when combined with responsive caregiving and opportunities for early learning. Some of the nutrition interventions did not include a nutritional supplement/commodity, nor even substantial nutrition education, and this may account for the lack of impact on growth.

KEY QUESTION V

What is the role of supporting maternal mental health on ECD outcomes?

Summary of evidence

The systematic review on maternal outcomes of anxiety and depression found an improvement in the severity of depressive and anxiety symptoms experienced by women in the perinatal period. However, limited benefits were noted in ECD outcomes.

Psychosocial maternal mental health interventions

These interventions target common maternal mental health conditions (i.e. depression and anxiety). The most commonly employed strategies include psychoeducation; cognitive behavioural therapy; interpersonal psychotherapy; and other strategies such as participatory learning, social support, aerobic exercise and music therapy; or a combination of strategies.

The effectiveness of psychosocial interventions for maternal mental health was evaluated across several maternal and child outcomes. Of the 17 included studies, the severity of symptoms of maternal anxiety was reported in five and maternal depressive symptoms in 14. Only four studies reported any child outcomes including: exclusive breastfeeding (n = 2), recent child illnesses (n = 2), care-seeking practices (n = 2), neonatal mortality (n = 1), low birth weight (n = 1), WAZ (n = 1), HAZ (n = 1), stunting (n = 1), body mass index (BMI) for age (n = 1), child anxiety symptoms (n = 1), emotional difficulties (n = 1), child cognitive development (n = 1) and play frequency (n = 1). Outcomes reported in two or more studies were included in the meta-analyses to yield a pooled effect size. The certainty of evidence by GRADE for the different outcomes is detailed in a separate subsection below for simplicity.

Interventions led to a significant improvement in maternal anxiety symptoms (SMD = -0.51, 95% CI: -0.72, -0.30) and maternal depressive symptoms (SMD = -0.70, 95% CI: -0.92, -0.47). Improvements were also noted in rates of exclusive breastfeeding (SMD = 0.16, 95% CI: 0.07, 0.25) and recent child illnesses (SMD = -0.61, 95% CI: -1.24, -0.03). No improvements were reported in care-seeking behaviours in the event of child illness (SMD = 0.44, 95% CI: -0.76, 1.54).

Improvements in other outcomes were reported in single studies: neonatal mortality (OR = 0.71, 95% CI = 0.62, 0.81); child cognitive development (SMD = 0.30, 95% CI: 0.14, 0.46) and play frequency (SMD = 0.58, 95% CI: 0.41, 0.75). No significant effects were reported in child anxiety

symptoms; low birth weight; WAZ; HAZ; stunting; BMI for age; or childhood emotional difficulties.

In subgroup analyses, no significant differences were found on considering specific components or theoretical orientation of the interventions, and persons delivering the intervention for the outcomes of anxiety and depression. Interventions focusing on depressive symptomatology delivered in homes (SMD = -1.1, 95% CI: -1.22, -0.89) yielded higher effect sizes, followed by community (SMD = -0.71, 95% CI: -1.18, -0.23) and hospital-based interventions (SMD = -0.65, 95% CI: -0.85, -0.45). However, analyses did not examine if the differences in effect sizes were significant.

In addition to the studies described above, a number of additional studies (n=16) for early childhood health and development were reviewed which also reported on maternal mental health outcomes. The interventions included elements of parent-child interaction, communication skills, nutrition, caregiver coping, social support and behavioural contracting.

Among these studies, a significant improvement was reported in symptoms of maternal anxiety (SMD = -0.49, 95% CI: -0.69, -0.29), depression (SMD = -0.18, 95% CI: -0.27, -0.10), (child) cognitive development (SMD = 0.57, 95% CI: 0.24, 0.90), infant engagement (SMD = 0.39, 95% CI: 0.20, 0.57), expressive language (SMD = 0.37, 95% CI: 0.05, 0.70), receptive language (SMD = 0.30, 95% CI: 0.09, 0.52), birth weight (SMD = 0.15, 95% CI: 0.02, 0.28), neonatal mortality (SMD = -0.23, 95% CI: -0.33, -0.13) and maternal involvement (SMD = 0.77, 95% CI: 0.13, 1.40). No significant effects were seen on HAZ (SMD = 0.08, 95% CI: -0.00, 0.16), WAZ (SMD = 0.14, 95% CI: -0.01, 0.28) and exclusive breastfeeding rates (OR = 2.95, 95% CI: 0.92, 9.46).

No significant improvement was reported in care-seeking (SMD = -0.13, 95% CI: -0.33, 0.07), recent child illness (SMD = -0.12, 95% CI: -0.40, 0.16), fine motor (SMD = 0.05, 95% CI: -0.04, 0.14) and gross motor skills (SMD = 0.07, 95% CI: -0.01, 0.15).

Subgroup analyses revealed that multicomponent interventions yielded higher effect sizes for depressive symptoms than single interventions. For cognitive development among children, higher effect sizes were reported for single component interventions, but one half of the included studies were of low quality.

Summary of the considerations of the members of the GDG for determining the direction and strength of the recommendation

A recommendation was formulated, informed by the evidence presented and consideration of the factors listed below.

Certainty of evidence

The overall certainty of evidence was rated as moderate. The certainty of evidence for several outcomes was rated as **high**: maternal anxiety symptoms, child anxiety, neonatal mortality, exclusive breastfeeding, WAZ, HAZ, stunting, BMI for age, emotional difficulties, child cognition and play frequency. The certainty was **moderate** for low birth weight; low for risk of child illnesses and exclusive breastfeeding; and **very low** for maternal depressive symptoms and for care-seeking attitudes.

Balance of benefits and harms

None of the studies included in the systematic review reported any undesirable effects associated with any of the interventions.

Values and preferences

No important uncertainty or variability in how the interventions are valued was noted. Recent studies in various settings on maternal psychosocial interventions have reported good uptake among pregnant women and acceptability among them and their family members (e.g. Cooper et al., 2002; Gao et al., 2010; Gao et al., 2015; Gu et al., 2015; Khan et al., 2017; Morris et al., 2012;). However, a recent feasibility evaluation of the Thinking Healthy Programme (Atif et al., 2017) revealed barriers in implementation of peer-delivered programmes.

Acceptability

These interventions appear to be acceptable to the affected population in LMICs. High retention rates were common in many of the studies included in the review. The attitudes of the mothers and community were generally positive, indicating good acceptability. Moreover, the attitudes of the health work force were positive (Cooper et al., 2009; Rahman et al., 2009).

Resource implications

There is uncertainty around the resource requirements for psychosocial interventions delivered during pregnancy and the postnatal period due to a lack of cost-effectiveness analyses for most included studies. Also, most of the evidence on cost-effectiveness is limited to the context of HICs, with little evidence available from LMICs.

Psychosocial interventions for common maternal mental health problems could have important effects on costs and outcomes. The most obvious effects might be that both specialist and non-specialist health care workers would be required to undertake more home visits, but that the prevalence of common mental disorders and its associated costs, such as medication use, would be reduced. Broader effects such as the impact on the infant, other children and the partner need also to be considered.

An estimate from the Healthy Activity Programme (Patel et al., 2017) found that the incremental cost per quality-adjusted life-year gained was US\$ 9333 (95% CI: US\$ 3862, US\$ 28 169), with an 87% chance of being cost-effective from a health system perspective in the study setting. It was found to be cost-effective as compared to the usual care.

In the recent Lancet series on ECD, the cost of integrating the Thinking Healthy component of the Mental Health Gap Action Programme (mhGAP)¹¹ into existing MCH services was estimated. The additional investment for scaling up support for maternal depression in MCH services was estimated to be US\$ 0.10 - 0.20 per person per year indicating that maternal mental health interventions can be added to MCH services at little additional cost (Richter et al., 2017).

The cost-effectiveness of psychosocial interventions is also corroborated by another systematic review summarizing 13 studies on economic evaluation of psychosocial interventions in HICs (Morrell et al., 2016).

Equity

The impact on health equity with these interventions would probably be positive because:

- Maternal depression is now recognized as a major public health concern. It is prevalent among mothers in LMICs and leads to poor emotional, physical and behavioural effects among the mothers.
- Maternal depression is associated with several adverse outcomes among children. These effects include low-birth-weight, stunting, preterm birth, respiratory disorders, intrauterine growth restriction, emotional problems and diarrhoeal illness in infants; and poor academic performance and increased risk of depression in infants born to depressed mothers.
- A general lack of specialist and non-specialist mental health workers warrants establishing cost-effective and culturally sensitive intervention programmes (WHO, 2014b).

¹¹ www.who.int/mental_health/evidence/mhGAP/en

Feasibility

The interventions are probably feasible to implement. The review indicated good effectiveness of the interventions across several outcomes, albeit the quality of the evidence ranges from low to moderate. Intervention features, such as number of sessions and duration or frequency, could be adapted for each particular setting, although there is not yet enough evidence to support this.

The costs of interventions can be reduced by employing trained and supported non-specialists and peers. However, the effect may be less than for specialist-delivered interventions.

Integrated interventions can further increase feasibility, by utilizing pre-established health care contacts and services. However, the need for strengthening health services, including more staff to deliver the desired interventions, should not be ignored.

RECOMMENDATION 4

WHO recommends:

- **Psychosocial interventions to support maternal mental health should be integrated into early childhood health and development services.**

Strength of recommendation: Strong; Certainty of evidence: Moderate

Rationale

Various factors were taken into account in making this recommendation. Based on the review, the findings for maternal outcomes (anxiety and depression) were consistent. The meta-analyses reported an improvement in the severity of depressive and anxiety symptoms in the perinatal period, yielding effect sizes of moderate strength. The GDG considered the indirect benefits of improved maternal mental health on caregiving and child development outcomes to merit a strong recommendation.

Remarks

The remarks in this section are intended to inform considerations for implementation of the recommendation.

- Given the high prevalence of common mental disorders among women in the antenatal and postpartum period, and the acceptability of programmes aimed at them, interventions targeted to these women need to be more widely implemented. Integrating them into services for improving ECD should help them gain greater coverage.
- Prevention services should be available in addition to services that treat mental health difficulties.
- Information related to the 'how' of programmes—i.e. how they are successfully implemented with regards to the training, supervision and compensation of delivery agents, key programme characteristics, and relevant barriers or facilitators—were not commonly reported. More of this type of information would be useful in order to improve the overall quality and reproducibility of implementation.
- Interventions need to be adapted to the local sociocultural setting.
- Most interventions were based in clinics and hospitals. There were only a few community- or workplace-based programmes. Embedding these interventions in local community centres, faith-based organizations and other community settings should be explored in future research.
- All of the interventions targeted expectant or new mothers. However, expectant fathers should also be considered stakeholders for these interventions in order to target relevant risk factors for maternal and child health (e.g. intimate partner violence and lack of involvement of fathers in parental care).

RESEARCH GAPS

The GDG highlighted several areas where there is insufficient evidence and where further research is required. These include:

1. The most effective responsive caregiving interventions that are feasible and scaleable in LMICs.
2. The effectiveness of caregiving/parenting interventions on child outcomes by population and setting.
3. Subgroup analysis for particular population groups (e.g. child and caregiver characteristics) on the effectiveness of interventions to improve responsive caregiving and facilitate early learning opportunities.
4. Costing of interventions, and data on resources required, to provide policy-makers with information to plan programmes.
5. The reliability and validity of tools employed to assess child and caregiving outcomes, as a large variety of tools are used, and many are unstandardized.
6. Optimization of combined nutrition and caregiving strategies.
7. Clear definitions and reporting guidelines are needed for interventions categorized as responsive caregiving, early learning promotion, and support for socioemotional and behavioural development.
8. Data that report on caregivers other than mothers, and measure outcomes on other caregivers.
9. Mechanisms for facilitating effective multi-sectoral approaches to improve ECD.
10. Effective processes to achieve implementation of ECD-specific interventions at scale.
11. Successful implementation of psychosocial interventions for maternal mental health with regards to the training, supervision and compensation to health care providers, delivery within community settings, and reporting of relevant barriers or facilitators.
12. Studies on maternal mental health that report on child health and development outcomes in addition to mental health outcomes.



IMPLEMENTATION OF THE GUIDELINE

IMPLEMENTATION CONSIDERATIONS

As this is a global guideline, Member States are expected to adapt the recommendations according to their setting and feasibility. WHO regional and country offices will assist with these processes.

Engaging with multiple stakeholders and partners will be critical in strengthening implementation and sustaining progress. Working in collaboration with the many sectors involved can help ensure a comprehensive, cross-sectoral and more sustainable approach.

Scaling-up programmes usually requires the endorsement of both local administrators and government policy-makers; effective leadership to transform processes; and training of health workers.

MONITORING AND EVALUATION OF THE QUALITY AND IMPLEMENTATION OF THE GUIDELINE

Monitoring and evaluation should be built into implementation processes, in order to document important lessons for uptake and further implementation.

WHO will use routine surveys to assess how ECD-specific recommendations are included into national policies and training courses. WHO will aim to collaborate with national authorities to include questions about the new recommendations, and how health workers have experienced implementing these, into relevant routine national training assessments and supervision.

SUPPORTING LOCAL ADAPTATION

Local adaptation of the guideline will be supported through WHO country offices and ministries of health. National guidelines, such as for antenatal, newborn and child care, that are likely to be affected by the recommendations will be specifically reviewed in order to integrate approaches where relevant.

National training courses and pre- and in-service training on maternal, newborn and child health and nutrition should be reviewed for opportunities to integrate materials.

National child health or similar programmes will coordinate local adaptation and implementation. Research institutions will be expected to facilitate the adaptation and contextualization. United Nations agencies, the World Bank Group and other partners such as the Partnership for Maternal, Newborn, Child and Adolescent Health and the ECD Action Network, should play a key role in dissemination of the guideline and in catalysing uptake in national guidelines, policies and practice tools.

DISSEMINATION AND PLANS FOR UPDATING

Dissemination

The current guideline will be posted on the WHO website. In addition, it will be disseminated through a broad network of international partners, including WHO country and regional offices, ministries of health, WHO collaborating centres, universities, other United Nations agencies and nongovernmental organizations. It is expected that the reviews will be published in peer-reviewed journals.

Plans for updating the guideline

The WHO Steering Group will continue to follow research developments in ECD, particularly for questions in which the quality of evidence was found to be low or very low. If the guideline merits an update, or if there are concerns that one or more recommendations in the guideline may no longer be valid, WHO will coordinate a guideline update, following the formal procedures of the *WHO handbook for guideline development* (WHO, 2014a).

As the guideline nears a five-year review period, WHO, along with partners, will be responsible for conducting a search for new evidence. WHO will welcome suggestions regarding additional questions for evaluation in the guideline when it is due for review.



REFERENCES

- About FE, Akhter S. A cluster-randomized evaluation of a responsive stimulation and feeding intervention in Bangladesh. *Pediatrics*. 2011; 127(5):e1191-7.
- About FE, Singla DR, Nahil MI, Borisova I. Effectiveness of a parenting program in Bangladesh to address early childhood health, growth and development. *Soc Sci Med*. 2013; 97:250-8.
- Atif N, Krishna RN, Sikander S, Lazarus A, Nisar A, Ahmad I et al. Mother-to-mother therapy in India and Pakistan: adaptation and feasibility evaluation of the peer-delivered Thinking Healthy Programme. *BMC Psychiatry*. 2017; 17:79. doi:10.1186/s12888-017-1244-z.
- Barlow A, Mullany B, Neault N, Goklish N, Billy T, Hastings R et al. Paraprofessional-delivered home-visiting intervention for American Indian teen mothers and children: 3-year outcomes from a randomized controlled trial. *Am J Psychiatry*. 2015; 172(2):154-62.
- Barrera ME, Rosenbaum PL, Cunningham CE. Early home intervention with low-birth-weight infants and their parents. *Child Dev*. 1986; 57(1):20-33.
- Black MM, About FE. Responsive feeding is embedded in a theoretical framework of responsive parenting. *J Nutr*. 2011; Symposium:490-4.
- Black MM, Dewey KG. Promoting equity through integrated early child development and nutrition interventions. *Ann NY Acad Sci*. 2014; 1308(1):1-10. doi:10.1111/nyas.12351.
- Black MM, Walker SP, Fernald LCH, Andersen CT, DiGirolamo AM, Lu C et al. Early childhood development coming of age: science through the life course. *Lancet*. 2017; 389(10064):77-90.
- Breitenstein SM, Gross D, Fogg L, Ridge A, Garvey C, Julion W et al. The Chicago Parent Program: comparing 1-year outcomes for African American and Latino parents of young children. *Res Nurs Health*. 2012; 35(5):475-89.
- Caldera D, Burrell L, Rodriguez K, Crowne SS, Rohde C, Duggan A. Impact of a statewide home visiting program on parenting and on child health and development. *Child Abuse Negl*. 2007; 31(8):829-52.
- Campbell F, Conti G, Heckman JJ, Moon SH, Pinto R, Pungello E et al. Early childhood investments substantially boost adult health. *Science*. 2014; 343(6178):1478-85. doi:10.1126/science.1248429.
- Caughy MOB, Huang KY, Miller T, Genevro JL. The effects of the Healthy Steps for Young Children Program: results from observations of parenting and child development. *Early Child Res Q*. 2004; 19(4):611-30.
- Cooper PJ, Landman M, Tomlinson M, Molteno C, Swartz L, Murray L. Impact of a mother-infant intervention in an indigent peri-urban South African context: pilot study. *B J Psych*. 2002; 180(1):76-81.
- Cooper PJ, Tomlinson M, Swartz L, Landman M, Molteno C, Stein A et al. Improving quality of mother-infant relationship and infant attachment in socioeconomically deprived community in South Africa: randomised controlled trial. *BMJ*. 2009; 338(7701):b974.
- DiGirolamo AM, Stansbery P, Lung'aho M. Advantages and challenges of integration: opportunities for integrating early childhood development and nutrition programming. *Ann NY Acad Sci*. 2014; 1308(1):46-53. doi:10.1111/nyas.12323.
- Ertem IO, Atay G, Dogan DG, Bayhan A, Bingoler BE, Gok CG et al. Mothers' knowledge of young child development in a developing country. *Child Care Health Dev*. 2007; 33(6):728-37.
- Fergusson DM, Grant H, Horwood LJ, Ridder EM. Randomized trial of the Early Start program of home visitation. *Pediatrics*. 2005; 116(6):e803-9.
- Frongillo EA, Nguyen PH, Saha KK, Sanghvi T, Afsana K, Haque R et al. Large-scale behavior-change initiative for infant and young child feeding advanced language and motor development in a cluster-randomized program evaluation in Bangladesh. *J Nutr*. 2017; 147(2):256-63.
- Gao LL, Chan SW, Li X, Chen S, Hao Y. Evaluation of an interpersonal-psychotherapy-oriented childbirth education program for Chinese first-time childbearing women: a randomised controlled trial. *Int J Nurs Studies*. 2010; 47(10):1208-16.
- Gao LL, Xie W, Yang X, Chan SW. Effects of an interpersonal-psychotherapy-oriented postnatal program for Chinese first-time mothers: a randomized controlled trial. *Int J Nurs Studies*. 2015; 52(1):22-9.
- Gardner JM, Powell CA, Baker-Henningham H, Walker SP, Cole TJ, Grantham-McGregor SM. Zinc supplementation and psychosocial stimulation: effects on the development of undernourished Jamaican children. *Am J Clin Nutr*. 2005; 82(2):399-405.
- Gertler P, Heckman J, Pinto R, Zanolini A, Vermeersch C, Walker S et al. Labor market returns to an early childhood stimulation intervention in Jamaica. *Science*. 2014; 344(6187):998-1001. doi:10.1126/science.1251178.
- Gladstone M, Phuka J, Thindwa R, Chitimbe F, Chidzalo K, Chndna J et al. Care for Child Development in rural Malawi: a model feasibility and pilot study. *Ann NY Acad Sci*. 2018; 1419(1):102-9. doi:10.1111/nyas.13725.

- Goodson BD, Layzer JI, Pierre RG, Bernstein LS, Lopez M. Effectiveness of a comprehensive, five-year family support program for low-income children and their families: findings from the Comprehensive Child Development Program. *Early Child Res Q.* 2000; 15(1):5-39.
- Gowani S, Yousafzai AK, Armstrong R, Bhutta ZA. Cost effectiveness of responsive stimulation and nutrition interventions on early child development outcomes in Pakistan. *Ann NY Acad Sci.* 2014; 1308:149-61.
- Grantham-McGregor S, Cheung YB, Cueto S, Glewwe P, Richter L, Strupp B et al. Developmental potential in the first 5 years for children in developing countries. *Lancet.* 2007; 369:60-70.
- Grantham-McGregor SM, Powell CA, Walker SP, Himes JH. Nutritional supplementation, psychosocial stimulation, and mental development of stunted children: the Jamaican Study. *Lancet.* 1991; 338(8758):1-5.
- Gross D, Garvey C, Julion W, Fogg L, Tucker S, Mokros H. Efficacy of the Chicago parent program with low-income African American and Latino parents of young children. *Prev Sci.* 2009; 10(1):54-65.
- Gu C, Wu X, Ding Y, Zhu X, Zhang Z. The effectiveness of a Chinese midwives' antenatal clinic service on childbirth outcomes for primipare: a randomised controlled trial. *Int J Nurs Studies.* 2013; 50(12):1689-97.
- Guedeney A, Wendlam P, Dugravier R, Saias T, Tubach F, Welniarz B et al. Impact of a randomized home-visiting trial on infant social withdrawal in the CAPEDP prevention study. *Infant Ment Health J.* 2013; 34(6):594-601.
- Helmizar H, Jalal F, Lipoeto NI, Achadi EL. Local food supplementation and psychosocial stimulation improve linear growth and cognitive development among Indonesian infants aged 6 to 9 months. *Asia Pac J Clin Nutr.* 2017; 26(1):97.
- Higgins JPT, Green S (editors). *Cochrane handbook for systematic reviews of interventions.* Chichester (UK): John Wiley & Sons, 2011.
- Hiscock H, Bayer JK, Price A, Ukoumunne OC, Rogers S, Wake M. Universal parenting programme to prevent early childhood behavioural problems: cluster randomised trial. *BMJ.* 2008; 336(7639):318-21.
- Hiscock H, Gulenc A, Ukoumunne OC, Gold L, Bayer J, Shaw D et al. Preventing preschool mental health problems: population-based cluster randomized controlled trial. *J Dev Behav Pediatr.* 2018; 39(1):55-65.
- Hurley KM, Yousafzai AK, Lopez-Boo F. Early child development and nutrition: a review of the benefits and challenges of implementing integrated interventions. *Adv Nutr.* 2016; 7(2):357-63. doi:10.3945/an.115.010363.
- Jacobs F, Easterbrooks MA, Goldberg J, Mistry J, Bumgarner E, Raskin M et al. Improving adolescent parenting: results from a randomized controlled trial of a home visiting program for young families. *Am J Public Health.* 2016; 106(2):342-9.
- Jain V, Irfan A, Vanikar GK. Program to Improve Private Early Education (PIPE): a case study of a systems approach for scaling quality early education solutions. *Ann NY Acad Sci.* 2018; 1419(1):38-56. doi:10.1111/nyas.13695.
- Jeong J, Franchett E, Yousafzai AK. Caregiving interventions to support early child development in the first three years of life: report of the systematic review of evidence. (www.who.int/maternal_child_adolescent/guidelines/SR_Caregiving_interventions_ECD_Jeong_Final_Nov2018.pdf?ua=1).
- Jin X, Sun Y, Jiang F, Ma J, Morgan C, Shen X et al. Care for development intervention in rural China: a prospective follow-up study. *J Dev Behav Pediatr.* 2007; 28(3):213-8.
- Khan MN, Dherani M, Chiumento A, Atif N, Bristow K, Sikander S et al. Evaluating feasibility and acceptability of a local psycho-educational intervention for pregnant women with common mental problems affected by armed conflict in Swat, Pakistan: a parallel randomized controlled feasibility trial. *Int J Soc Psych.* 2017; 63(8):724-35.
- Lancet. Advancing early childhood development: from science to scale. *Lancet.* 2017; 389:10064.
- Leung C, Tsang S, Lo C. Evaluation of Parent and Child Enhancement (PACE) program: randomized controlled trial. *Res Social Work Practice.* 2017; 27(1):19-35.
- Love JM, Kisker EE, Ross C, Raikes H, Constantine J, Boller K et al. The effectiveness of early head start for 3-year-old children and their parents: lessons for policy and programs. *Dev Psychol.* 2005; 41(6):885-901.
- Lozoff B, Smith JB, Clark KM, Perales CG, Rivera F, Catillo M. Home Intervention improves cognitive and social-emotional scores in iron-deficient anemic infants. *Pediatrics.* 2010; 126(4):e884-94.
- Mendelsohn AL, Valdez P, Flynn V, Foley G, Berkule S, Tomopoulos S et al. Use of videotaped interactions during pediatric well-child care: impact at 33 months on parenting and on child development. *J Dev Behav Pediatr.* 2007; 28:206-12.
- Menon P, Nguyen PH, Saha KK, Khaled A, Sanghvi T, Baker J et al. Combining intensive counseling by frontline workers with a nationwide mass media campaign has large differential impacts on complementary feeding practices but not on child growth: results of a cluster-randomized program evaluation in Bangladesh-3. *J Nutr.* 2016; 146(10):2075-84.
- Mental health atlas. Geneva: World Health Organization; 2014b.
- Morrell CJ, Sutcliffe P, Booth A, Stevens J, Scope A, Stevenson M et al. A systematic review, evidence synthesis and meta-analysis of quantitative and qualitative studies evaluating the clinical effectiveness, the cost-effectiveness, safety and acceptability of interventions to prevent postnatal depression. *Health Technol Asses.* 2016; 20(37).
- Morris J, Jones L, Berrino A, Jordans MJD, Okema L, Crow C. Does combining infant stimulation with emergency feeding improve psychosocial outcomes for displaced mothers and babies? A controlled evaluation from Northern Uganda. *Am J Orthopsych.* 2012; 82(3):349-57. doi:10.1111/j.1939-0025.2012.01168.x.

- Muhoozi GKM, Atukunda P, Diep LM, Mwadime R, Kaaya AN, Skare AB et al. Nutrition, hygiene, and stimulation education to improve growth, cognitive, language, and motor development among infants in Uganda: a cluster-randomized trial. *Matern Child Nutr.* 2018; 14(2):e12527.
- Murray L, De Pascalis L, Tomlinson M, Vally Z, Dadomo H, MacLachlan B et al. Randomized controlled trial of a book-sharing intervention in a deprived South African community: effects on carer-infant interactions, and their relation to infant cognitive and socioemotional outcome. *J Child Psychol Psychiatry.* 2016; 57(12):1370-9.
- Nabarro D. Global child and maternal nutrition—the SUN rises. *Lancet.* 2013; 382(9893):666-7. doi:10.1016/S0140-6736(13)61086-7.
- Nahar B, Hossain I, Hamadani JD, Ahmed T, Grantham-McGregor S, Persson LA. Effect of a food supplementation and psychosocial stimulation trial for severely malnourished children on the level of maternal depressive symptoms in Bangladesh. *Child Care Health Dev.* 2015; 41(3):483-93.
- Nahar B, Hossain MI, Hamadani JD, Ahmed T, Huda SN, Grantham-McGregor SM et al. Effects of a community-based approach of food and psychosocial stimulation on growth and development of severely malnourished children in Bangladesh: a randomised trial. *Eur J Clin Nutr.* 2012; 66(6):701-9.
- Norr KF, Crittenden KS, Lehrer EL, Reyes O, Boyd CB, Nacion KW et al. Maternal and infant outcomes at one year for a nurse-health advocate home visiting program serving African Americans and Mexican Americans. *Public Health Nurs.* 2003; 20(3):190-203.
- Patel V, Weobong B, Weiss HA, Anand A, Bhat B, Katti B et al. The Healthy Activity Program (HAP), a lay counsellor-delivered brief psychological treatment for severe depression, in primary care in India: a randomised controlled trial. *Lancet.* 2017; 389(10065):176–85. doi :10.1016/S0140-6736(16) 31589-6 PMID: 27988143.
- Rahman A, Iqbal Z, Roberts C, Husain N. Cluster randomized trial of a parent-based intervention to support early development of children in a low-income country. *Child Care Health Dev.* 2009; 35(1):56-62.
- Rahman A, Fisher J, Waqas A, Hamdani SU, Zafar W, Suleman N et al. Psychotherapeutic interventions for common maternal mental health problems among women to improve early childhood development in low- and middle-income countries: report of systematic review and meta-analysis of RCTs. (www.who.int/maternal_child_adolescent/guidelines/SR_Psych_Therapeutic_interventions_ECD_Rahman_Final_Sept2018.pdf?ua=1)
- Richter LM, Daelmans B, Lombardi J, Heymann J, Boo FL, Behrman JR et al. Investing in the foundation of sustainable development: pathways to scale up for early childhood development. *Lancet.* 2017; 389(10064):103-18.
- Rockers PC, Fink G, Zanolini A, Banda B, Biemba G, Sullivan C et al. Impact of a community-based package of interventions on child development in Zambia: a cluster-randomised controlled trial. *BMJ Global Health.* 2016; 1(3):e000104.
- Schwarz DF, O’Sullivan AL, Guinn J, Mautone JA, Carlson EZ, Zhao H et al. Promoting early intervention referral through a randomized controlled home-visiting program. *J Early Intervention.* 2012; 34(1):20-39.
- Shaw DS, Connell A, Dishion TJ, Wilson MN, Gardner F. Improvements in maternal depression as a mediator of intervention effects on early childhood problem behavior. *Dev Psychopathol.* 2009; 21(2): 417-39.
- Singla DR, Kumbakumba E, Aboud FE. Effects of a parenting intervention to address maternal psychological wellbeing and child development and growth in rural Uganda: a community-based, cluster randomised trial. *Lancet Glob Health.* 2015; 3(8):e458-69.
- Van Zeijl J, Mesman J, Van Ijzendoorn MH, Bakermans-Kranenburg MJ, Juffer F, Stolk MN et al. Attachment-based intervention for enhancing sensitive discipline in mothers of 1-to 3-year-old children at risk for externalizing behavior problems: a randomized controlled trial. *J Consult Clin Psychol.* 2006; 74(6):994.
- Vazir S, Engle P, Balakrishna N, Griffiths PL, Johnson JL, Creed-Kanashiro HM et al. Cluster-randomized trial on complementary and responsive feeding education to caregivers found improved dietary intake, growth and development among rural Indian toddlers. *Matern Child Nutr.* 2013; 9(1):99-117.
- Wagner M, Spiker D, Linn MI. The effectiveness of the Parents as Teachers program with low-income parents and children. *Topics Early Child Spec Educ.* 2002; 22(2):67-81.
- Walkup JT, Barlow A, Mullany BC, Pan W, Goklish N, Hasting R et al. Randomized controlled trial of a paraprofessional-delivered in-home intervention for young reservation-based American Indian mothers. *J Am Acad Child Adolesc Psychiatry.* 2009; 48(6):591-601.
- WHO handbook for guideline development. Geneva: World Health Organization; 2014a.
- WHO, UNICEF, World Bank Group. Nurturing care for early childhood development: a framework for helping children survive and thrive to transform health and human potential. Geneva: World Health Organization; 2018.
- Yousafzai AK, Aboud F. Review of implementation processes for integrated nutrition and psychosocial stimulation interventions. *Ann NY Acad Sci.* 2014; 1308(1):33-45. doi: 10.1111/nyas.12313.
- Yousafzai A, Aboud FE, Nores M, Britto PR (editors). *Ann NY Acad Sci. Special issue: implementation research and practice for early childhood development.* 2018; 1419.
- Yousafzai AK, Rasheed MA, Rizvi A, Armstrong R, Bhutta ZA. Effect of integrated responsive stimulation and nutrition interventions in the Lady Health Worker programme in Pakistan on child development, growth, and health outcomes: a cluster-randomised factorial effectiveness trial. *Lancet.* 2014; 384(9950):1282-93.
- Yousafzai AK, Rasheed MA, Rizvi A, Armstrong R, Bhutta ZA. Parenting skills and emotional availability: an RCT. *Pediatrics.* 2015; 135(5):e1247-57.



ANNEX 1:

WHO GUIDELINES AND TOOLS THAT SUPPORT EARLY CHILDHOOD DEVELOPMENT

WHO recommendations for improving infant and child health are included in a range of guidelines, tools and training materials. Many of these are relevant for improving ECD. Areas of child health and public health for which WHO guidelines are relevant include neonatal care; infant and young child nutrition; environmental health; prevention and treatment of childhood illnesses; violence and injury prevention; prevention of obesity and promotion of physical activity; caregiver mental health; and support for children with developmental difficulties or disability.

a. Infant and young child feeding

Ensuring that infants are provided with optimal feeding from birth helps to improve ECD.

Breastfeeding counselling: a training course

Exclusive and continued breastfeeding significantly contribute to ECD. This course is designed to provide health workers with the skills needed to support mothers and their children to breastfeed optimally. It includes guides for the course director and trainers, a participant's manual, a booklet with overhead figures, a slide book and annexes.

www.who.int/maternal_child_adolescent/documents/who_cdr_93_3/en

Infant and young child feeding counselling: an integrated course

This integrated infant feeding counselling course is designed to give health workers the competencies required to carry out effective counselling for breastfeeding, HIV and infant feeding and complementary feeding. It is designed for a five-day training of health workers in primary health care services and for lay counsellors.

www.who.int/nutrition/publications/infantfeeding/9789241594745/en

Combined course on growth assessment and infant and young child feeding counselling

This course is designed to give health workers the competencies required to carry out growth assessment and effective counselling for breastfeeding and complementary feeding. It is primarily for health workers in primary health care services and for lay counsellors. The course imparts skills for measuring, plotting and interpreting a child's growth status (to detect undernutrition or overweight/obesity), for assessing breastfeeding and complementary feeding to identify any problems, and for counselling caregivers to promote/reinforce appropriate practices and manage growth or feeding problems.

www.who.int/nutrition/publications/infantfeeding/9789241504812/en

Guideline: counselling of women to improve breastfeeding practices

This guideline provides global, evidence-informed recommendations on breastfeeding counselling, as a public health intervention, to improve breastfeeding practices among pregnant women and mothers who intend to breastfeed, or are currently breastfeeding, and their infants and children. It makes recommendations for breastfeeding counselling, such as frequency, timing, mode and provider of breastfeeding counselling.

www.who.int/nutrition/publications/guidelines/counselling-women-improve-bf-practices/en

NetCode toolkit for ongoing monitoring and periodic assessment of the Code

The Network for Global Monitoring and Support for Implementation of the International Code of Marketing of Breast-milk Substitutes (NetCode) toolkit aims to reinvigorate and reinforce ongoing monitoring and periodic assessment of the Code and national laws by providing protocols, guidance and tools. Findings and results from implementation of either protocol can be used to advocate for the strengthening of existing legislative and regulatory frameworks.

www.who.int/nutrition/netcode/toolkit/en

Optimal feeding of low-birth-weight infants in low- and middle-income countries

This guideline contains recommendations for a specific high-risk population including on what to feed low-birth-weight infants, when to start feeding, how to feed, how often and how much to feed. The implementation of these guidelines in LMICs is expected to improve care and survival of low-birth-weight infants.

www.who.int/maternal_child_adolescent/documents/infant_feeding_low_bw/en

Management of children with severe acute malnutrition

This guideline provides global, evidence-informed recommendations on a number of specific issues related to the management of severe acute malnutrition in infants and children. It gives guidance on the care of infants and children with severe malnutrition, including in the context of HIV. This guideline includes recommendations on play and stimulation of these children.

http://apps.who.int/iris/bitstream/10665/95584/1/9789241506328_eng.pdf?ua=1

Protecting, promoting and supporting breastfeeding in facilities providing maternity and newborn services

This publication updates the *Ten steps to successful breastfeeding*. It provides global, evidence-informed recommendations on protection, promotion and support of optimal breastfeeding in facilities providing maternity and newborn services, as a public health intervention. It is intended to contribute to discussions among stakeholders when selecting or prioritizing appropriate actions in their efforts to achieve the *Sustainable Development Goals* and the global targets for 2025. The document presents the key recommendations, a summary of the supporting evidence and a description of the considerations that contributed to the deliberations and consensus decision-making.

www.who.int/nutrition/publications/guidelines/breastfeeding-facilities-maternity-newborn/en

Implementation guidance: protecting, promoting and supporting breastfeeding in facilities providing maternity and newborn services – the revised Baby-friendly Hospital Initiative

This document updates the *Ten steps to successful breastfeeding* and contains the latest version of the guidance for implementing the Baby-friendly Hospital Initiative (BFHI) in facilities providing maternity and newborn services, as well as guidance for coordination and management of the BFHI at national (or subnational where applicable) level. The core purpose of the BFHI is to ensure that mothers and newborns receive timely and appropriate

care before and during their stay in a facility providing maternity and newborn services, to enable the establishment of optimal feeding of newborns, which promotes their health and development. Given the proven importance of breastfeeding, the BFHI protects, promotes and supports breastfeeding, while enabling timely and appropriate care and feeding of newborns who are not breastfed.

www.who.int/nutrition/publications/infantfeeding/bfhi-implementation/en

b. Responsive caregiving and opportunities for early learning

Responsive caregiving and opportunities for early learning, starting from birth, are core components of nurturing care and essential for all young children to develop their full potential.

Care for child development

These materials guide health workers and other counsellors as they help families build stronger relationships with their children and solve problems in caring for their children at home. “Care for child development” recommends play and communication activities for families to stimulate the learning of their children. Also, through play and communication, adults learn how to be sensitive to the needs of children and respond appropriately to meet them.

www.who.int/maternal_child_adolescent/documents/care_child_development/en

Caring for the child's health growth and development

These materials guide health workers and other providers as they counsel caregivers on infant and young child feeding, responsive caregiving and opportunities for early learning through play and communication, prevention of childhood illness and timely care-seeking. They are part of a 3-part set entitled *Caring for newborns and children in the community* and are appropriate for use by community health workers.

www.who.int/maternal_child_adolescent/documents/child-healthy-growth-development/en

Early childhood development and disability

This discussion paper provides a brief overview of issues pertaining to ECD and disability. It lays the foundation for a long-term strategic and collaborative process aimed at improving the developmental outcomes, participation and protection of young children with disabilities. It promotes dialogue between United Nations agencies and relevant stakeholders to identify sustainable strategies which build on existing efforts and expand on multisectoral approaches to guarantee the rights of young children with disabilities and their families.

http://apps.who.int/iris/bitstream/10665/75355/1/9789241504065_eng.pdf

c. Antenatal, childbirth and postnatal care

Healthy birth, including the prevention and management of preterm births and low birth weight, is important to optimize child development outcomes.

Recommendations on antenatal care for a positive pregnancy experience

Updated in 2015, this publication contains numerous recommendations that have a direct bearing on ECD outcomes. These include: nutrition in pregnancy including iron, folate and other micronutrient supplements; assessments of partner violence; tobacco and other substance abuse; obstetric care; management of common infectious diseases; community-based interventions to improve communication and support; and antenatal care contact schedules.

<http://apps.who.int/iris/bitstream/am/10665/250796/1/9789241549912-eng.pdf?ua=1>

Companion of choice during labour and childbirth for improved quality of care

This publication summarizes the recommendations and evidence around allowing women to have a companion of choice during labour and childbirth. This can be a low-cost and effective intervention to improve the quality of maternity care.

<http://apps.who.int/iris/bitstream/10665/250274/1/WHO-RHR-16.10-eng.pdf?ua=1>

Prevention and treatment of maternal peripartum infections

The goal of this guideline is to consolidate guidance for effective interventions that are needed to reduce the global burden of maternal infections and their complications around the time of childbirth. This forms part of WHO's efforts to improve the quality of care for leading causes of maternal death, especially those clustered around the time of childbirth, in the post-Millennium Development Goal era. Specifically, it presents evidence-based recommendations on interventions for preventing and treating genital tract infections during labour, childbirth or the puerperium, with the aim of improving outcomes for both mothers and newborns.

http://apps.who.int/iris/bitstream/10665/186171/1/9789241549363_eng.pdf?ua=1

Interventions to improve preterm birth outcomes

This guideline is focused on interventions that could be provided during pregnancy, labour and the newborn period with the aim of improving outcomes for preterm infants.

http://apps.who.int/iris/bitstream/10665/204270/1/WHO_RHR_15.22_eng.pdf?ua=1

Postnatal care of the mother and newborn

This guideline focuses on postnatal care of mothers and newborns in resource-limited settings in LMICs. Recommendations address timing, number and place of postnatal contacts, and content of postnatal care for all mothers and babies during the six weeks after birth, including assessment of mothers and newborns to detect problems or complications. The primary audience is health professionals who are responsible for providing postnatal care to women and newborns.

http://apps.who.int/iris/bitstream/10665/97603/1/9789241506649_eng.pdf

Standards for improving quality of maternal and newborn care in health facilities

This publication provides a framework for improving the quality of care for mothers and newborns around the time of childbirth. It encompasses both the provision and experience of care around eight domains of quality that should be assessed, improved and monitored within the context of health system building blocks.

www.who.int/maternal_child_adolescent/documents/improving-maternal-newborn-care-quality/en

Network for improving quality of care for maternal, newborn and child health

This website provides access to resources, country examples, country data, webinars and podcasts, and facilitates exchange with peers on latest evidence and challenges and how to address them.

www.qualityofcarenetwork.org

d. Violence and injury prevention and support for children with disability

Ensuring a safe and secure environment, especially for children with disability, is central to a nurturing care environment.

INSPIRE: seven strategies for ending violence against children

INSPIRE is an evidence-based resource for everyone involved with preventing and responding to violence against children and adolescents – from government to grassroots, and from civil society to the private sector. It represents a select group of strategies based on the best available evidence to help countries and communities intensify their focus on the prevention programmes and services with the greatest potential to reduce violence against children. The seven strategies are: implementation and enforcement of laws; norms and values; safe environments; parent and caregiver support; income and economic strengthening; response and support services; and education and life skills.

<http://apps.who.int/iris/bitstream/10665/207717/1/9789241565356-eng.pdf>

Preventing violence: evaluating outcomes of parenting programmes

This publication provides guidance on how to evaluate parenting programmes that have the purpose of preventing violence against children.

www.who.int/violence_injury_prevention/publications/violence/parenting_evaluations/en

Parenting for lifelong health

These programme manuals (facilitator manuals and parent handbooks, including for babies, toddlers and young children) describe seven strategies that can help countries and communities to focus on the most promising programmes to prevent violence against children.

www.who.int/violence_injury_prevention/violence/child/PLH-manuals/en/index1.html

Global disability action plan 2014-2021

This action plan supports the implementation of measures that are designed to meet the rights of persons with disabilities as enshrined in the Convention on the Rights of Persons with Disabilities. It proposes actions to support the commitments made at a United Nations General Assembly high-level meeting on disability and development to ensure access for persons with disabilities to health care services, including rehabilitation, habilitation and assistive devices; improve disability data collection, analysis and monitoring; and promote knowledge, social awareness and understanding of disability.

http://apps.who.int/iris/bitstream/10665/199544/1/9789241509619_eng.pdf?ua=1

Ten strategies for keeping children safe on the road

This document outlines ten strategies which are known – especially when implemented as a package of measures – to keep children safe on the road. These include: controlling speed; reducing drinking and driving; using helmets for bicyclists and motorcyclists; restraining children in vehicles; improving children's ability to see and be seen; enhancing road infrastructure; adapting vehicle design; reducing risks for young drivers; providing appropriate care for injured children; and supervising children around roads.

http://apps.who.int/iris/bitstream/10665/162176/1/WHO_NMH_NVI_15.3_eng.pdf?ua=1&ua=1&ua=1

e. Mental health

Maternal mental health is known to directly impact on child care practices and nurturing care. Several WHO recommendations that are relevant for ECD are located in the mhGAP evidence resource centre (www.who.int/mental_health/mhgap/evidence/child/en).

The mhGAP intervention guide for mental, neurological and substance use disorders in non-specialist health settings

These guidelines include psychosocial interventions for maternal mental health. They present the integrated management of priority mental health conditions using algorithms for clinical decision-making and are for use by doctors, nurses and other health workers as well as health planners and managers.

www.who.int/mental_health/mhgap/mhGAP_intervention_guide_02/en

Comprehensive and Coordinated Efforts for the Management of Autism Spectrum Disorders

This World Health Assembly resolution urges countries to include appropriate recognition to the specific needs of individuals affected by autism spectrum disorders and other developmental disorders in policies and programmes related to early childhood and adolescent development, as part of a comprehensive approach to address child and adolescent mental health and developmental disorders.

www.who.int/mental_health/maternal-child/WHA67.8_resolution_autism.pdf?ua=1

WHO toolkit for the care and support of people affected by complications associated with Zika virus

This toolkit has been developed with the goal of enhancing country preparedness for Zika virus outbreaks. Using a systems approach, it guides public health planners and managers on the identification and incorporation of necessary infrastructure and resources as needed, as well as technical and practical guidance for health care professionals and community workers.

www.who.int/mental_health/neurology/zika_toolkit/en/

Thinking healthy - a manual for psychological management of perinatal depression

The *Thinking healthy* manual outlines an evidence-based approach describing why and how community health workers can address perinatal depression through evidence-based psychosocial interventions recommended by the mhGAP and tailored to the perinatal period. RCTs and other rigorously evaluated research in Bangladesh, India, Pakistan and Peru have shown the feasibility, effectiveness, and cultural acceptability of this training

package and can provide valuable lessons learned and tools for implementation in other settings.

www.who.int/mental_health/maternal-child/thinking_healthy/en

f. Environmental health

A secure and safe environment is one of the central domains for nurturing care.

Inheriting a sustainable world? Atlas on children's health and the environment

The *Atlas* describes existing and emerging challenges to children's environmental health. It provides a detailed review of the major environmental hazards to children's health as a result of increasing urbanization, industrialization, globalization and climate change and delineates the role of the health sector in reducing children's environmental exposures.

www.who.int/ceh/publications/inheriting-a-sustainable-world/en

The impact of the environment on children's health

This document focuses on the impacts of the environment on children under 5 years, although older children are also considered. It presents the disease burden in children, the potential burden of disease that could be prevented by environmental interventions, and gives examples of these interventions.

www.who.int/ceh/publications/don-t-pollute-my-future/en

Investing in water and sanitation: increasing access, reducing inequalities

This report by the United Nations-Water Global Analysis and Assessment of Sanitation and Drinking-Water presents data from 94 countries, covering all regions. It also includes data from 23 external support agencies, representing over 90% of official development assistance for sanitation and drinking water.

http://apps.who.int/iris/bitstream/10665/139735/1/9789241508087_eng.pdf?ua=1

Progress on drinking water, sanitation and hygiene

This report by the Programme for Water Supply, Sanitation and Hygiene contains estimates of national, regional and global progress on drinking water, sanitation and hygiene. It uses service 'ladders' to enable benchmarking and comparison of progress across countries at different stages of development.

<http://apps.who.int/iris/bitstream/10665/258617/1/9789241512893-eng.pdf?ua=1>

Air pollution and child health: prescribing clean air

This report summarizes the latest scientific knowledge on the links between exposure to air pollution and adverse health effects in children. It is intended to inform and motivate individual and collective action by health care professionals to prevent damage to children's health from exposure to air pollution.

www.who.int/ceh/publications/air-pollution-child-health/en

g. Neonatal care and the prevention and treatment of severe morbidity in young children

Ensuring good health from the neonatal period to later childhood is essential for optimal child development.

Survive and thrive: transforming care for every small and sick newborn. Key findings.

This publication recommends that nurses work in partnership with families, teach caregivers to care for infants and meet their developmental needs with skin-to-skin contact, responsive feeding with breast milk, routine caregiving, and stimulating the infant's senses with touching, talking, singing, and gentle motion. Engaging primary caregivers in the care of the newborn increases caregiver bonding with the newborn and competencies in caring for their child, making the transition to home easier.

<https://apps.who.int/iris/bitstream/handle/10665/276655/WHO-FWC-MCA-18.11-eng.pdf?ua=1>

Managing possible serious bacterial infection in young infants when referral is not feasible

This document provides guidance on care for use in resource-limited settings or in settings where families with sick young infants do not accept or cannot access referral care, but can be managed in outpatient settings by an appropriately trained health worker. The guideline seeks to provide programmatic guidance on the role of community health workers and home visits in identifying signs of serious infections in neonates and young infants.

www.who.int/maternal_child_adolescent/documents/bacterial-infection-infants/en

Integrated management of childhood illness

A comprehensive set of materials exists including treatment algorithms related to general danger signs; young infant; cough or difficult breathing; diarrhoea; fever; ear infections; malnutrition and anaemia; HIV; and well-child care. In-person and distance learning modules are also available.

www.who.int/maternal_child_adolescent/documents/9789241506823/en

Essential newborn care course

This course aims to ensure that health workers have the skills and knowledge to provide appropriate care at the most vulnerable period in an infant's life. Health workers are taught to use WHO's *Pregnancy, childbirth, postpartum and newborn care: a guide for essential practice* – particularly the sections concerned with newborn care – that provides up-to-date evidence-based information on management of babies with a range of needs in the initial newborn period.

www.who.int/maternal_child_adolescent/documents/newborncare_course/en

Caring for newborns and children in the community: a training course for community health workers

This training course is part of a WHO-UNICEF package which is aimed at increasing the coverage of household and community interventions to reduce newborn and child mortality and promote the healthy growth and development of young children. The package consists of three courses (*Caring for the newborn at home, Caring for the sick child and Caring for the child's healthy growth and development*) which can be offered separately or in combination.

<http://apps.who.int/iris/handle/10665/204273>

WHO recommendations on home-based records for maternal, newborn and child health

Home-based maternal, newborn and child health records build a bridge between health facilities and staff and the mother and family. They have been found to improve care-seeking behaviours, male involvement and support in the household, maternal and child home care practices, infant and child feeding, and communication between health providers and families.

www.who.int/maternal_child_adolescent/documents/home-based-records-guidelines/en

Standards for improving the quality of care for children and young adolescents in health facilities

These paediatric framework and standards take into account the best interest of children and their individual rights, recognizing that their health, physical, psychosocial, developmental and communication needs differ from those of adults. Health services therefore should not only treat conditions, but must address the whole child, and his/her needs for development and wellbeing, within the context of the family. The framework has eight domains for improving the quality of care and addresses the most common conditions that affect children and adolescents in health facilities.

<https://apps.who.int/iris/bitstream/handle/10665/272346/9789241565554-eng.pdf?ua=1>

h. Diet, physical activity and health

Achieving recommendations on physical activity and prevention of obesity serve to promote ECD.

Guidelines on physical activity, sedentary and sleep time in young children

As part of the Ending Childhood Obesity initiative, this guideline provides recommendations on the amount and types of physical activity, how to decrease sedentary behaviour and screen time, and sleep time for infants and young children up to 5 years of age.

<https://apps.who.int/iris/handle/10665/311664>

Report of the Commission on Ending Childhood Obesity: implementation plan: executive summary

This document provides a summary of recommended actions for policy-makers. It can inform which package of integrated interventions may best be implemented in particular settings to achieve the target of halting the rise in childhood obesity. It recognizes that the prevalence of childhood obesity, the risk factors that contribute to this issue, and the political and economic situations differ between Member States and provides relevant supporting information.

<https://apps.who.int/iris/bitstream/handle/10665/259349/WHO-NMH-PND-ECHO-17.1-eng.pdf?sequence=1>

ANNEX 2:

QUESTIONS IN PICO FORMAT

KEY QUESTION I

What is the effectiveness of responsive caregiving interventions in the first 3 years of life on ECD?

Population: Conception to 3 years of life, global

Intervention: Caregiving interventions that only implement responsive caregiving

Comparison: Standard of care or control

Outcomes: **CHILD**

Critical:

- Cognitive development
- Language development
- Motor development
- Socioemotional development

Important:

- Attachment
- HAZ
- WAZ
- Behaviour problems

CAREGIVER

Important:

- Caregiving knowledge
 - Caregiving practices
 - Caregiver-child interaction
 - Caregiver depressive symptoms
-

KEY QUESTION II

What is the effectiveness of caregiving interventions that promote early learning in the first 3 years of life on ECD?

Population: Conception to 3 years of life, global

Intervention: Caregiving interventions that only support early learning and development

Comparison: Standard of care or control

Outcomes: **CHILD**

Critical:

- Cognitive development
- Language development
- Motor development
- Socioemotional development

Important:

- Attachment
- HAZ
- WAZ
- Behaviour problems

CAREGIVER

Important:

- Caregiving knowledge
 - Caregiving practices
 - Caregiver-child interactions
 - Caregiver depressive symptoms
-

KEY QUESTION III

What is the effectiveness of caregiving interventions to support socioemotional and behavioural development in the first 3 years of life on ECD?

Population:	Caregivers and their children in the first 3 years of life
Intervention:	Caregiving interventions that support socioemotional and behavioural development
Comparison:	Standard of care or comparison groups without caregiving interventions to support healthy child socioemotional and behavioural development
Outcomes:	<p>CHILD</p> <p><i>Critical:</i></p> <ul style="list-style-type: none"> • Cognitive development • Motor development • Prosocial behaviour/socioemotional development <p><i>Important:</i></p> <ul style="list-style-type: none"> • Behaviour problems <p>CAREGIVER</p> <p><i>Important:</i></p> <ul style="list-style-type: none"> • Caregiving practices • Caregiving knowledge • Caregiver-child interactions • Self-efficacy • Caregiver mental health

KEY QUESTION IV

What is the effectiveness of integrated caregiving and nutrition interventions in the first 3 years of life on ECD and child growth outcomes?

- What are the independent and additive effects of caregiving and nutrition interventions in the first 3 years of life on ECD and child growth outcomes?
- Do the effects on ECD and child growth outcomes differ between programmes that are targeted for young children with moderate to severe malnutrition compared to general programmes?

Population:	Conception to 3 years of life, global
Intervention:	Combined caregiving and nutrition interventions
Comparison:	Standard of care or control
Outcomes:	<p>CHILD</p> <p><i>Critical:</i></p> <ul style="list-style-type: none"> • Cognitive development • Language development • Motor development • Socioemotional development <ul style="list-style-type: none"> • HAZ • WAZ • WHZ

KEY QUESTION V

What is the role of supporting maternal mental health as a key influence on ECD outcomes?

Population: Pregnant women or women who have recently given birth

Intervention: Psychological intervention for depression and anxiety

Comparison: Care as usual

Outcomes: **CHILD**

Critical:

- Cognition/cognitive development
- Expressive language
- Receptive language
- Gross motor
- Fine motor
- Emotional difficulties
- Anxiety
- Low birth weight
- WAZ
- HAZ
- Stunting
- BMI for age

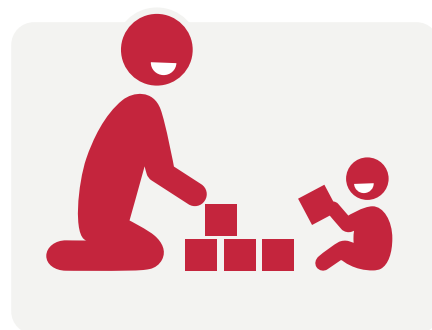
Important:

- Play frequency
- Exclusive breastfeeding
- Recent illnesses
- Care-seeking (for childhood illnesses)
- Risk of childhood illnesses
- Neonatal mortality

MATERNAL

Important:

- Anxiety symptoms
 - Depressive symptoms
 - Maternal involvement
-



ANNEX 3:

STEERING GROUP

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Marie-Noël Bruné Drisse

Environment, Climate Change and Health

Robert Alexander Butchart

Social Determinants of Health

Neerja Chowdhary

Mental Health and Substance Abuse

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Maternal, Newborn, Child and Adolescent Health and Ageing

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Mental Health and Substance Abuse

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ANNEX 4:

GUIDELINE DEVELOPMENT GROUP

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ANNEX 4:

GUIDELINE DEVELOPMENT GROUP *(continued)*

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ANNEX 5:

AUTHORS OF SYSTEMATIC REVIEWS

World Health Organization recommendations on caregiving interventions to support early child development in the first 3 years of life: *report of the systematic review of evidence*

Joshua Jeong

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Emily Franchett

Department of Global Health and Population, Harvard T H Chan School of Public Health, Boston, MA, United States

Aisha Yousafzai*

Department of Global Health and Population, Harvard T H Chan School of Public Health, Boston, MA, United States

World Health Organization recommendation on psychotherapeutic interventions for common maternal mental health problems among women to improve early childhood development in low- and middle-income countries: *report of systematic review and meta-analysis of RCTs*

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* Team lead

ANNEX 6:

DECLARATIONS OF CONFLICTS OF INTEREST

Surname	First name	Affiliation	Declaration
Aboud	Frances	McGill University, Canada	Received consultancy payments from UNICEF, Aga Khan Foundation and Brooking Institution totaling less than US\$ 30 000.
Fisher	Jane	Monash University, Australia	Was Chair of the Australian National Health and Medical Research Council's Mental Health and Parenting Committee. Declared that in her capacities as the Jean Hailes Professor of Women's Health in the School of Public Health and Preventive Medicine at Monash University, Australia, and as President (2016–2018) of the International Marce Society for Perinatal Health received (2017) AUS\$ 5000.
Gupta	Subodh	India	Research funding - ₹12 000 000 received from WHO country office (2014).
Krishnamurthy	Vibha	India	Research grant entitled "Development of an International Guide to Monitor and Support Child Development", from the National Institute of Health, USA. The award - US\$ 60 000 per annum for 5 years (since 2015) was made to the organization that employs her. Also declared her participation in the Rehabilitation Council of India, the National Trust and the Task Force for Persons with Disabilities for RTE (not paid).
Richter	Linda	University of the Witwatersrand, South Africa	Research grant (US\$ 218 000 from Conrad Hilton Foundation over two years) to review guidance on implementation parameters of programmes to support young children affected by HIV and AIDS.
Tomlinson	Mark	Stellenbosch University, South Africa	Research funding – US\$ 30 000 received from the Hilton Foundation (2014).
Yousafzai	Aisha	Harvard University, USA	Employer received US\$ 500 000 from Grand Challenges, Canada. Also, has personally received travel support and per diem from WHO for consultancy work.

Other participants reported no specific interests.



ANNEX 7:

GRADE EVIDENCE PROFILE TABLES

RESPONSIVE CAREGIVING INTERVENTIONS (N=17)

Certainty assessment								Effects	Certainty	Importance
Child outcome	No. of studies	Design	Limitations in study design and execution	Inconsistency	Indirectness	Imprecision	Publication bias	Pooled effect size (95% CI)		
Cognitive development	3	RCTs	No serious limitations	Serious limitations ¹	No serious limitations	Serious limitations ²	No serious limitations	0.26 (-0.14, 0.66); n=1	●●○○ LOW	CRITICAL
Language development	5	RCTs	No serious limitations	No serious limitations	No serious limitations	Serious limitations ²	No serious limitations	0.08 (-0.07, 0.23); n=5	●●●○ MODERATE	CRITICAL
Motor development	2	RCTs	No serious limitations	Serious limitations ³	No serious limitations	No serious limitations	No serious limitations	0.19 (0.12, 0.26); n=1	●●●○ MODERATE	CRITICAL
Socioemotional development	4	RCTs	No serious limitations	No serious limitations	Serious limitations ⁴	Serious limitations ²	No serious limitations	0.14 (-0.03, 0.30); n=4	●●○○ LOW	CRITICAL
Attachment outcomes	7	RCTs	No serious limitations	Serious limitations ⁵	No serious limitations	Serious limitations ²	No serious limitations	0.13 (-0.11, 0.37); n=3	●●○○ LOW	CRITICAL
HAZ	1	RCT	No serious limitations	No serious limitations	Serious limitations ⁶	No serious limitations	No serious limitations	0.10 (0.03, 0.16); n=1	●●●○ MODERATE	IMPORTANT
WAZ	1	RCT	No serious limitations	No serious limitations	Serious limitations ⁶	No serious limitations	No serious limitations	0.03 (-0.04, 0.10); n=1	●●●○ MODERATE	IMPORTANT
Behaviour problems	7	RCTs	No serious limitations	No serious limitations	Serious limitations ⁴	Serious limitations ²	No serious limitations	-0.14 (-0.29, 0.002); n=7	●●○○ LOW	IMPORTANT

¹ Positive effects reported by Barrera et al., 1986; null effects observed in remaining studies.

² Wide CI around the pooled estimate.

³ Positive impacts found by Frongillo et al. (2017), but no impact found by Barrera et al. (1992).

⁴ Studies all from HICs.

⁵ Six studies found null effects; one found positive effects (Cooper et al., 2009).

⁶ The intervention only provided the responsive feeding component of responsive caregiving.

Certainty assessment								Effects	Certainty	Importance
Caregiving outcome	No. of studies	Design	Limitations in study design and execution	Inconsistency	Indirectness	Imprecision	Publication bias	Pooled effect size (95% CI)		
Caregiving knowledge	1	RCT	No serious limitations	No serious limitations	Serious limitations ¹	Serious limitations ²	No serious limitations	0.29 (-0.01, 0.58); n=1	●●○○ LOW	IMPORTANT
Caregiving practices	3	RCTs	No serious limitations	Serious limitations ³	No serious limitations	Serious limitations ²	No serious limitations	0.53 (-0.10, 1.17); n=2	●●○○ LOW	IMPORTANT
Caregiver-child interaction	8	RCTs	No serious limitations	Serious limitations ⁴	No serious limitations	Serious limitations ²	No serious limitations	0.34 (0.15, 0.54); n=6	●●○○ LOW	IMPORTANT
Caregiver depressive symptoms	3	RCTs	No serious limitations	No serious limitations	No serious limitations	Serious limitations ²	No serious limitations	-0.21 (-0.39, -0.04); n=3	●●○○ MODERATE	IMPORTANT

¹ Studies all from HICs.

² Wide CI around the pooled estimate.

³ Two studies found positive impacts (Murray et al., 2016; Barrera et al., 1986); one study found no impacts (Mendelsohn et al., 2007).

⁴ Two studies found no impacts (Barrera et al., 1986; Van Zeijl et al., 2006); remaining studies found significant positive impacts.

RESPONSIVE CAREGIVING INTERVENTIONS (N=22)

Certainty assessment								Effects	Certainty	Importance
Child outcome	No. of studies	Design	Limitations in study design and execution	Inconsistency	Indirectness	Imprecision	Publication bias			
Cognitive development	13	RCTs	No serious limitations	Serious limitations ¹	No serious limitations	Serious limitations ²	No serious limitations	0.20 (0.01, 0.39); n=8	●●○○ LOW	CRITICAL
Language development	9	RCTs	No serious limitations	Serious limitations ³	No serious limitations	Serious limitations ²	No serious limitations	0.07 (-0.11, 0.24); n=6	●●○○ LOW	CRITICAL
Motor development	7	RCTs	No serious limitations	Serious limitations ⁴	No serious limitations	Serious limitations ²	No serious limitations	0.32 (0.12, 0.52); n=5	●●○○ LOW	CRITICAL
Socioemotional development	9	RCTs	No serious limitations	Serious limitations ⁵	Serious limitations ⁶	Serious limitations ²	No serious limitations	0.28 (0.09, 0.48), n=3	●○○○ VERY LOW	CRITICAL
Attachment outcomes	2	RCTs	No serious limitations	No serious limitations	Serious limitations ⁶	Serious limitations ²	No serious limitations	0.30 (0.09, 0.51); n=1	●●○○ LOW	IMPORTANT
HAZ	2	RCTs	No serious limitations	No serious limitations	No serious limitations	Serious limitations ²	No serious limitations	-0.02 (-0.29, 0.24); n=2	●●●○ MODERATE	IMPORTANT
WAZ	2	RCTs	No serious limitations	No serious limitations	No serious limitations	Serious limitations ²	No serious limitations	0.05 (-0.10, 0.19); n=2	●●●○ MODERATE	IMPORTANT
Behaviour problems	8	RCTs	No serious limitations	Serious limitations ⁷	Serious limitations ⁶	Serious limitations ²	No serious limitations	-0.25 (-0.54, 0.04); n=3	●○○○ VERY LOW	IMPORTANT

¹ Positive effects in some (Muhoozi et al., 2018); null effects in others (Norr et al., 2003).

² Wide CI around the pooled estimate.

³ Muhoozi et al. (2018) and Schwarz et al. (2012): null effects; Jin et al. (2007): positive impacts.

⁴ Variation in direction and magnitude of effects: null effects in some (Rockers et al., 2016) and positive effects in others (Jin et al., 2007).

⁵ In five out of the six other studies that could not be meta-analysed, there are no statistical differences.

⁶ Studies all from HICs.

⁷ Mixed evidence with some studies finding differences (e.g. Leung et al., 2017; Caughy et al., 2004) versus others finding no significant differences (e.g. Goodson et al., 2000; Jacobs et al., 2016).

Certainty assessment								Effects		
Caregiving outcome	No. of studies	Design	Limitations in study design and execution	Inconsistency	Indirectness	Imprecision	Publication bias	Pooled effect size (95% CI)	Certainty	Importance
Caregiving knowledge	3	RCTs	No serious limitations	Serious limitations ¹	No serious limitations	Serious limitations ²	No serious limitations	NA	●●○○ LOW	IMPORTANT
Caregiving practices	8	RCTs	No serious limitations	Serious limitations ³	Serious limitations ⁴	Serious limitations ⁵	No serious limitations	0.05 (-0.04, 0.13); n=2	●●○○ LOW	IMPORTANT
Caregiver-child interaction	5	RCTs	No serious limitations	Serious limitations ⁶	Serious limitations ⁴	Serious limitations ²	No serious limitations	NA	●●○○ LOW	IMPORTANT
Caregiver depressive symptoms	4	RCTs	No serious limitations	No serious limitations	No serious limitations	Serious limitations ⁷	No serious limitations	0.07 (-0.08, 0.22); n=2	●●○○ MODERATE	IMPORTANT

¹ Two studies found significant improvements (Jin et al., 2007; Walkup et al., 2009); one study found no effects (Wagner et al., 2002).

² No studies with data to contribute to pooled estimate.

³ One study (Love et al., 2005) found statistically significant improvements; the other studies reported no impact.

⁴ Studies all from HICs.

⁵ Over half the studies have a small sample size.

⁶ Some studies reported positive effects (Caughy et al., 2004; Love et al., 2005); other studies reported no impact (Goodson et al., 2000; Wagner et al., 2002).

⁷ Wide CI around the pooled estimate.

CAREGIVING INTERVENTIONS TO SUPPORT HEALTHY CHILD SOCIOEMOTIONAL AND BEHAVIOURAL DEVELOPMENT (N=10)

Certainty assessment								Effects	Certainty	Importance
Child outcome	No. of studies	Design	Limitations in study design and execution	Inconsistency	Indirectness	Imprecision	Publication bias	Pooled effect size (95% CI)		
Cognitive development	1	RCT	No serious limitations	No serious limitations	Serious limitations ¹	Very serious limitations ²	No serious limitations	No pooled effect size ³	●○○○○ VERY LOW	CRITICAL
Motor development	1	RCT	No serious limitations	No serious limitations	Serious limitations ¹	Very serious limitations ²	No serious limitations	No pooled effect size ⁴	●○○○○ VERY LOW	CRITICAL
Prosocial behaviour/ socioemotional development	1	RCT	No serious limitations	No serious limitations	Serious limitations ¹	Very serious limitations ²	No serious limitations	No pooled effect size ⁵	●○○○○ VERY LOW	CRITICAL
Behaviour problems	10	RCTs	No serious limitations	No serious limitations ⁶	Serious limitations ⁷	No serious limitations	No serious limitations	-0.02 (-0.07, 0.02); n=5	●●●○○ MODERATE	IMPORTANT

¹ One study only, from HIC.

² One study only, pooled analysis NA.

³ Caldera et al. (2007): adjusted effect size for Bayley Scales of Infant Development Mental Development Index = 0.29; p < 0.05

⁴ Caldera et al. (2007): adjusted effect size for Bayley Scales of Infant Development Physical Development Index = 0.19; p = 0.16

⁵ Barlow et al. (2015): adjusted effect size for Infant-Toddler Social and Emotional Assessment = 0.14; p = 0.09.

⁶ I² = 9.9%; 95% CIs are overlapping. Additional n = 5 studies: n = 1: no effects; n = 1: significant reductions in mean scores for child behaviour problems; n = 3: significant reductions on some domains but not all.

⁷ Studies all from HICs.

Certainty assessment								Effects	Certainty	Importance
Caregiver outcome	No. of studies	Design	Limitations in study design and execution	Inconsistency	Indirectness	Imprecision	Publication bias	Pooled effect size (95% CI)		
Caregiving practices	8	RCTs	No serious limitations	Serious limitations ¹	Serious limitations ²	Serious limitations	No serious limitations	0.01 (-0.04, 0.06); n=2	●●○○ LOW	IMPORTANT
Caregiving knowledge	2	RCTs	No serious limitations	Serious limitations ⁴	Serious limitations ²	Serious limitations ⁵	No serious limitations	NA	●○○○ VERY LOW	IMPORTANT
Caregiver-child interactions	5	RCTs	No serious limitations	Serious limitations ⁶	Serious limitations ²	Serious limitations ⁵	No serious limitations	0.14 (-0.07, 0.34); n=1	●○○○ VERY LOW	IMPORTANT
Self-efficacy	3	RCTs	No serious limitations	Serious limitations	Serious limitations ²	Serious limitations ⁵	No serious limitations	NA	●●○○ LOW	IMPORTANT
Caregiver mental health	4	RCTs	No serious limitations	Serious limitations ³	Serious limitations ²	No serious limitations	No serious limitations	-0.05 (-0.11, 0.01); n=3	●●○○ LOW	IMPORTANT

¹ n = 4 no effects; n = 3 mixed effects by subscale; n = 1 significant improvements.

² Studies all from HICs.

³ 95% CIs for Shaw et al. (2009) and Hiscock et al. (2008) are not overlapping. Shaw et al. (2009) and Barlow et al. (2015), found significant declines; Hiscock et al. (2008) and Hiscock et al. (2018) found no effects.

⁴ Barlow et al. (2015) found significant improvements; Caldera et al. (2007) found no effects.

⁵ Data not suitable to conduct meta-analysis.

⁶ n = 2 found no effects; n = 1 found significant improvements; n = 1 found mixed results across measures.

⁷ Breitenstein et al. (2012) and Caldera et al. (2007) found significant improvements; Gross et al. (2009) found no effects.

INTEGRATED CAREGIVING AND NUTRITION INTERVENTIONS (N=18)

Combined nutrition and caregiving interventions versus standard of care

Certainty assessment								Effects	Certainty	Importance
Child outcome	No. of studies	Design	Limitations in study design and execution	Inconsistency	Indirectness	Imprecision	Publication bias			
Cognitive development	14	RCTs	No serious limitations	Serious limitations ¹	No serious limitations	Serious limitations ²	No serious limitations	0.57 (0.32, 0.82); n=13	●●○○ LOW	CRITICAL
Language development	10	RCTs	No serious limitations	Serious limitations ³	No serious limitations	Serious limitations ²	No serious limitations	0.40 (0.17, 0.63); n=10	●●○○ LOW	CRITICAL
Motor development	10	RCTs	No serious limitations	Serious limitations ⁴	No serious limitations	Serious limitations ^{2,5}	No serious limitations	0.4 (0.26, 0.53); n=10	●●○○ LOW	CRITICAL
Socioemotional development	2	RCTs	No serious limitations	Serious limitations ⁶	No serious limitations	Serious limitations ²	No serious limitations	0.09 (-0.11, 0.30); n=2	●●○○ LOW	CRITICAL
HAZ	9	RCTs	No serious limitations	Serious limitations ⁷	No serious limitations	Serious limitations ²	No serious limitations	-0.13 (-0.31, 0.05); n=9	●●○○ LOW	CRITICAL
WAZ	7	RCTs	No serious limitations	No serious limitations	No serious limitations	No serious limitations	No serious limitations	0.06 (-0.02, 0.13); n=7	●●●● HIGH	CRITICAL
WHZ	6	RCTs	No serious limitations	No serious limitations	No serious limitations	Serious limitations ²	No serious limitations	0.20 (0.05, 0.34); n=6	●●●○ MODERATE	CRITICAL

¹ Variation in magnitude and direction of effects; some studies have null effects (Rockers et al., 2016; Nahar et al., 2012), while others have positive effects (Aboud et al., 2013; Grantham-McGregor et al., 1991).

² Wide CI around the pooled estimate.

³ Variation in magnitude and direction of effects: Muhoozi et al. (2018) found negative impacts; Aboud et al. (2013) and Yousafzai et al. (2014) found positive impacts.

⁴ Variation in magnitude and direction of effects. Nahar et al. (2012) and Vazir et al. (2013) found null effects, whereas others found positive impacts (Yousafzai et al., 2014; Muhoozi et al., 2018).

⁵ Five of the 10 studies have small sample sizes.

⁶ Yousafzai et al. (2015) found no impacts; Muhoozi et al. (2018) found positive impacts.

⁷ Nahar et al. (2012) and Helmizar et al. (2017) found negative impacts; others found null effects.

Combined nutrition and caregiving interventions versus caregiving interventions

Certainty assessment								Effects	Certainty	Importance
Child outcome	No. of studies	Design	Limitations in study design and execution	Inconsistency	Indirectness	Imprecision	Publication bias	Pooled effect size (95% CI)		
Cognitive development	7	RCTs	No serious limitations	Serious limitations ¹	No serious limitations	Serious limitations ²	No serious limitations	0.10 (-0.12, 0.32); n=6	●●○○ LOW	CRITICAL
Language development	10	RCTs	No serious limitations	No serious limitations	No serious limitations	Serious limitations ²	No serious limitations	0.01 (-0.09, 0.10); n=6	●●●○ MODERATE	CRITICAL
Motor development	10	RCTs	No serious limitations	Serious limitations ³	No serious limitations	Serious limitations ²	No serious limitations	0.18 (-0.06, 0.42); n=6	●●○○ LOW	CRITICAL
Socioemotional development	1	RCT	No serious limitations	Serious limitations	No serious limitations	Serious limitations ²	No serious limitations	0.11 (-0.04, 0.26); n=1	●●○○ LOW	CRITICAL
HAZ	9	RCTs	No serious limitations	Serious limitations ⁴	No serious limitations	Serious limitations ²	No serious limitations	-0.21 (-0.60, 0.19); n=4	●●○○ LOW	CRITICAL
WAZ	3	RCTs	No serious limitations	No serious limitations	No serious limitations	Serious limitations ⁵	No serious limitations	0.07 (-0.04, 0.17); n=3	●●●○ MODERATE	CRITICAL
WHZ	4	RCTs	No serious limitations	No serious limitations	No serious limitations	Serious limitations ^{2,6}	No serious limitations	0.16 (0.03, 0.29); n=4	●●●○ MODERATE	CRITICAL

¹ Yousafzai et al. (2014): negative effects; Gardner et al. (2005) and Grantham-McGregor et al. (1991): positive effects.

² Wide CI around the pooled estimate.

³ Gardner et al. (2005) found positive impacts; other studies (Yousafzai et al., 2014; Nahar et al., 2012) found no impacts.

⁴ Nahar et al. (2012) found negative effects; Aboud & Akhter (2011) and Yousafzai et al. (2014) found null effects.

⁵ Two of the three studies have small sample sizes.

⁶ Three of the four studies have small sample sizes.

Combined nutrition and caregiving interventions versus caregiving interventions

Certainty assessment								Effects	Certainty	Importance
Child outcome	No. of studies	Design	Limitations in study design and execution	Inconsistency	Indirectness	Imprecision	Publication bias			
Cognitive development	10	RCTs	No serious limitations	Serious limitations ¹	No serious limitations	Serious limitations ^{2,3}	No serious limitations	0.45 (0.22, 0.67); n=9	●●○○ LOW	CRITICAL
Language development	6	RCTs	No serious limitations	No serious limitations	No serious limitations	Serious limitations ⁴	No serious limitations	0.21 (0.13, 0.28); n=6	●●●○ MODERATE	CRITICAL
Motor development	9	RCTs	No serious limitations	No serious limitations	No serious limitations	No serious limitations	No serious limitations	0.14 (0.07, 0.22); n=9	●●●● HIGH	CRITICAL
Socioemotional development	1	RCTs	No serious limitations	No serious limitations	No serious limitations	Serious limitations ²	No serious limitations	-0.09 (-0.24, 0.07); n=1	●●○○ LOW	CRITICAL
HAZ	4	RCTs	No serious limitations	Serious limitations ⁵	No serious limitations	Serious limitations ^{2,6}	No serious limitations	-0.42 (-0.85, 0.01); n=4	●●○○ LOW	CRITICAL
WAZ	4	RCTs	No serious limitations	No serious limitations	No serious limitations	Serious limitations ⁷	No serious limitations	0.06 (-0.02, 0.14); n=4	●●●○ MODERATE	CRITICAL
WHZ	5	RCTs	No serious limitations	Serious limitations ⁸	No serious limitations	Serious limitations ⁹	No serious limitations	0.17 (-0.04, 0.38); n=5	●●○○ LOW	CRITICAL

¹ Variation in direction and magnitude of effects: Lozoff et al. (2010) found positive effects; Nahar et al. (2013) found null effects. CIs for Lozoff et al. (2010) and Nahar et al. (2013) do not overlap.

² Wide CI around the pooled estimate.

³ Five of the nine studies have small sample sizes.

⁴ Three of the six studies have small sample sizes.

⁵ Variation in magnitude and direction of effects: Nahar et al. (2012) found negative impacts; Menon et al. (2016) found positive impacts.

⁶ Two of the four studies have small sample sizes.

⁷ Two of the four studies have small sample sizes.

⁸ Helmizar et al. (2017) found positive impacts, while the other studies did not.

⁹ Three of the five studies have small sample sizes.

PSYCHOSOCIAL MATERNAL MENTAL HEALTH INTERVENTIONS

Certainty assessment							No. of patients		Effect		Certainty	Importance
No. of studies	Study design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	Perinatal psychological interventions	Care as usual	Relative (95% CI)	Absolute (95% CI)		
Outcome: Child cognition												
1	RCT	Not serious	Not serious	Not serious	Not serious	None	289	295	–	SMD 0.3 SD higher (0.136 higher to 0.463 higher)	●●●● HIGH	CRITICAL
Outcome: Childhood emotional difficulties												
1	RCT	Not serious	Not serious	Not serious	Not serious	None	289	295	–	SMD 0.082 SD higher (0.08 lower to 0.244 higher)	●●●● HIGH	CRITICAL
Outcome: Child anxiety												
1	RCT	Not serious	Not serious	Not serious	Not serious	None	289	295	–	SMD 0.141 SD higher (0.021 lower to 0.304 higher)	●●●● HIGH	CRITICAL
Outcome: Low birth weight												
1	RCT	Not serious	Not serious	Not serious	Serious ⁴	None	167	167	–	SMD 0.096 SD lower (0.465 lower to 0.273 higher)	●●●●○ MODERATE	CRITICAL
Outcome: Child WAZ												
1	RCT	Not serious	Not serious	Not serious	Not serious	None	368	359	–	SMD 0.015 SD lower (0.264 lower to 0.233 higher)	●●●● HIGH	CRITICAL
Outcome: Child HAZ												
1	RCT	Not serious	Not serious	Not serious	Not serious	None	368	359	–	SMD 0.156 SD higher (0.01 higher to 0.302 higher)	●●●● HIGH	CRITICAL
Outcome: Child stunting												
1	RCT	Not serious	Not serious	Not serious	Not serious	None	360	345	–	SMD 0.172 SD lower (0.347 lower to 0.029 higher)	●●●● HIGH	CRITICAL
Outcome: Child BMI for age												
1	RCT	Not serious	Not serious	Not serious	Not serious	None	289	295	–	SMD 0.075 SD lower (0.237 lower to 0.087 higher)	●●●● HIGH	CRITICAL

Certainty assessment							No. of patients		Effect		Certainty	Importance
No. of studies	Study design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	Perinatal psychological interventions	Care as usual	Relative (95% CI)	Absolute (95% CI)		
Outcome: Child play frequency												
1	RCT	Not serious	Not serious	Not serious	Not serious	None	360	345	–	SMD 0.582 SD higher (0.412 higher to 0.752 higher)	●●●● HIGH	IMPORTANT
Outcome: Exclusive breastfeeding												
2	RCTs	Not serious	Not serious	Not serious	Not serious	None	9836	8478	–	SMD 0.155 SD higher (0.065 higher to 0.246 higher)	●●●● HIGH	CRITICAL
Outcome: Recent illnesses (child)												
2	RCTs	Not serious	Serious ¹	Not serious	Serious ³	None	9167	8464	–	SMD 0.607 SD lower (1.239 lower to 0.025 lower)	●●○○○ LOW	IMPORTANT
Outcome: Care-seeking												
2	RCTs	Not serious	Serious ¹	Not serious	Very serious ³	None	9167	8464	–	SMD 0.436 SD higher (0.67 lower to 1.541 higher)	●○○○○ VERY LOW	IMPORTANT
Outcome: Neonatal mortality												
1	RCT	Not serious	Not serious	Not serious	Not serious	None	9770	9260	–	SMD 0.187 SD lower (0.26 lower to 0.114 lower)	●●●● HIGH	IMPORTANT
Outcome: Maternal anxiety symptoms												
4	RCTs	Not serious	Not serious	Not serious	Not serious	None	204	207	–	SMD 0.51 SD lower (0.511 lower to 0.302 lower)	●●●● HIGH	IMPORTANT
Outcome: Maternal depressive symptoms												
14	RCTs	Not serious	Serious ¹	Not serious	Not serious	Publication bias strongly suspected ²	8245	7878	–	SMD 0.695 SD lower (0.924 lower to 0.465 lower)	●●○○○ LOW	IMPORTANT

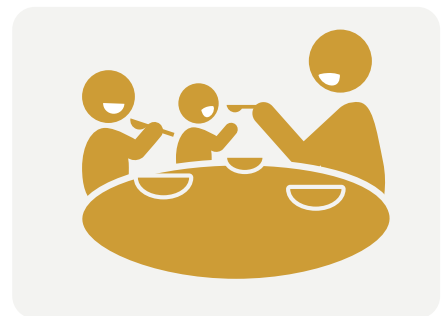
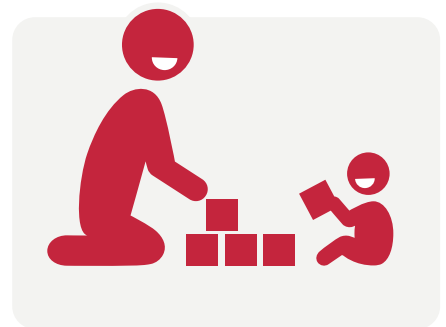
Explanations:

¹ Substantial heterogeneity was detected ($I^2 = 93.93\%$). It was partly explained by subgroup analysis.

² Asymmetric funnel plot; Egger's regression statistic < 0.1 .

³ CI for the pooled estimate is not consistent with benefit and harm.

⁴ Downgraded for imprecision by one level because the results are based on a single study, with a relatively small sample size and few events.



OTHER INTERVENTIONS ON MATERNAL MENTAL HEALTH*

Certainty assessment							No. of patients		Effect		Certainty	Importance
No. of studies	Study design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	Intervention	Comparison	Relative	Pooled effect size (95% CI)		
Outcome: Child cognitive development												
5	RCTs	Not serious	Serious ²	Not serious	Not serious	None	1638	1615	–	SMD 0.568 SD higher (0.238 higher to 0.899 higher)	●●●○ MODERATE	CRITICAL
Outcome: Child expressive language												
3	RCTs	Not serious	Serious ²	Not serious	Not serious	None	1382	1390	–	SMD 0.372 SD higher (0.045 higher to 0.699 higher)	●●●○ MODERATE	CRITICAL
Outcome: Child receptive language												
4	RCTs	Not serious	Serious ²	Not serious	Not serious	None	1542	1521	–	SSMD 0.304 SD higher (0.085 higher to 0.522 higher)	●●●○ MODERATE	CRITICAL
Outcome: Child gross motor												
2	RCTs	Not serious	Not serious	Not serious	Not serious	None	1161	1164	–	SMD 0.068 SD higher (0.013 lower to 0.149 higher)	●●●● HIGH	CRITICAL
Outcome: Child fine motor												
1	RCT	Not serious	Not serious	Not serious	Not serious	None	945	954	–	SMD 0.054 SD higher (0.036 lower to 0.144 higher)	●●●● HIGH	CRITICAL
Outcome: Child HAZ												
6	RCTs	Not serious	Not serious	Not serious	Not serious	None	2182	2102	–	SMD 0.081 SD higher (0.001 lower to 0.163 higher)	●●●● HIGH	CRITICAL
Outcome: Child WAZ												
3	RCTs	Not serious	Not serious	Not serious	Not serious	None	1585	1535	–	SMD 0.135 SD higher (0.009 lower to 0.278 higher)	●●●● HIGH	CRITICAL
Outcome: Exclusive breastfeeding												
4	RCTs	Not serious	Serious ²	Not serious	Serious ³	None	9494	10 571	–	0 (0 to 0)	●●○○ LOW	IMPORTANT

* Interventions included elements of parent-child interaction, communication skills, nutrition, caregiver coping, social support and behavioural contracting

Certainty assessment							No. of patients		Effect		Certainty	Importance
No. of studies	Study design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	Intervention	Comparison	Relative	Pooled effect size (95% CI)		
Outcome: Care-seeking for childhood illnesses												
3	RCTs	Not serious ¹	Not serious	Not serious	Not serious	None	9496	10 519	–	SMD 0.129 SD lower (0.329 lower to 0.07 higher)	●●●● HIGH	IMPORTANT
Outcome: Care-seeking for childhood illnesses												
2	RCTs	Not serious	Not serious	Not serious	Not serious	None	381	357	–	SMD 0.118 SD lower (0.4 lower to 0.164 lower)	●●●● HIGH	IMPORTANT
Outcome: Maternal involvement												
6	RCTs	Not serious	Serious ²	Not serious	Not serious	None	729	676	–	SMD 0.765 SD higher (0.129 higher to 1.402 higher)	●●●○ MODERATE	IMPORTANT
Outcome: Neonatal mortality												
1	RCT	Serious ¹	Not serious	Not serious	Not serious	None	8819	9896	–	SSMD 0.226 SD lower (0.328 lower to 0.125 lower)	●●●○ MODERATE	IMPORTANT
Outcome: Maternal anxiety symptoms												
3	RCTs	Serious ¹	Not serious	Not serious	Not serious	None	197	198	–	SMD 0.49 SD lower (0.691 lower to 0.29 lower)	●●●○ MODERATE	IMPORTANT
Outcome: Maternal depressive symptoms												
11	RCTs	Serious ¹	Not serious	Not serious	Not serious	None	6448	6887	–	SMD 0.182 SD lower (0.279 lower to 0.095 lower)	●●●○ MODERATE	IMPORTANT

Explanations:

¹ A majority of studies reporting this outcome had an overall high or unclear risk of bias across several matrices. However, subgroup analysis revealed no threat to validity of pooled results among high- and low-quality studies.

² Substantial heterogeneity was observed in reporting of this outcome, explainable by subgroup analyses, and variability in content of intervention and psychometric instruments.

³ Wide CIs; 95% CI includes no effect, and the upper or lower confidence limit crosses the minimal important difference.

