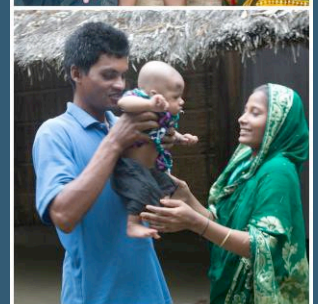
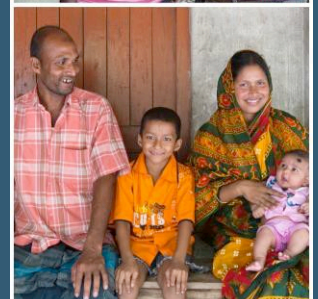
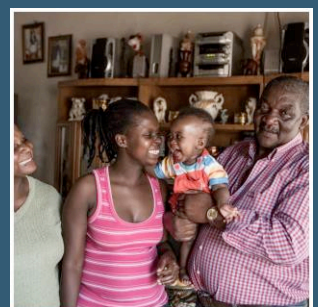


A SYSTEMATIC REVIEW OF PARENTING PROGRAMMES FOR YOUNG CHILDREN IN LOW AND MIDDLE INCOME COUNTRIES

An extensive research review of Early Childhood Development parenting programmes, in low and middle-income countries. The review addresses the knowledge gap and provides evidence for better programming for children and families.

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A Systematic Review of Parenting Programmes for Young Children

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ACRONYM LIST

ACEV-Mother and Child Foundation

ARI-Acute Respiratory Infection

CDW-Child Development Worker

CONIN-Corporation for Childhood Nutrition

CRC-Conventions on the Rights of the Child

DHE-Dental Health Education

ECC – Early Childhood Caries

ECD-Early Childhood Development

ENA-Essential Nutrition Actions

IMCI-Integrated Management for Childhood Illness

ITI-International Trachoma Initiative

LMIC-Low and middle income countries

MDG's-Millennium Development Goals

MICS-Multiple Indicator Cluster Survey

MOCEP –Mother Child Education

Programme

MTSP-Medium Term Strategic Plan

PICO – Population Intervention Comparison Outcomes

PMTCT – Prevention of Mother to Child Transmission

PROBIT - Promotion of Breastfeeding Intervention Trial

RCT – Random Control Trials

RUTF- Ready-to-use therapeutic foods

SAFE-Surgery for Trichiasis, Facial Cleanliness and Environmental Improvement

TEEP – Turkey Early Enrichment Project

UNICEF-United Nations Children's Fund

WHO-World Health Organization

EXECUTIVE SUMMARY

JUSTIFICATION

The Convention on the Rights of the Child (CRC) and ample scientific evidence acknowledge that parenting is one of the strongest influences on children, particularly, during their early childhood years. Early life experiences form the foundation for brain architecture and scientists now know that a major ingredient in this brain development process is the interaction between children with their parents or caregivers (Center on the Developing Child, Harvard University, 2015). Despite this widespread recognition, there are several gaps in our knowledge of what works, to promote positive parenting practices, particularly in vulnerable contexts. Data stemming from the Multiple Indicator Cluster Survey (MICS), from Low and Middle Income Countries (LMIC), suggest that at best, only, half of the parents surveyed engage in parenting behaviors that are considered positive and beneficial for Early Childhood Development (ECD). To address these programmatic and knowledge gaps in parenting practices, UNICEF commissioned a systematic review of the literature to address gaps in the understanding of what promotes effective, sensitive and responsive child rearing and caring practices through ECD parenting programmes and interventions in different national, community and local contexts. The purpose of this systematic research review was to evaluate the efficacy of Early Childhood Development (ECD) parenting programmes and examine the elements of programming that maximize its benefits to young children and their families.

BACKGROUND

When a baby is born, the billions of brain cells are open to sculpting itself in response to early experiences. To function, brain cells must be organized into networks that require trillions of connections, which depend on the interaction between genes and the environment. That optimal environment is created through nurturing environments such as positive parenting (National Scientific Council on the Developing Child, 2004). These

early connections shape brain circuits and lay the foundation for the developmental outcome later. While genes provide the blueprint for development, it is the interaction with the environment that ultimately shapes it. The early years provide a critical window of opportunity but also present the risk of vulnerability when neglected. Parents, key caregivers and families have the influencing power to determine a child's chances for survival and development. Rapid strides made by young children across all domains of development and learning are fostered and supported through parents' practices, attitudes, knowledge and resources. The multi-disciplinary and transnational literature on parenting clearly indicates that parents are one of the most influential factors in children's development (Bornstein, 2002; Bradley and Corwyn, 2005; Rogoff, 2003; Whiting and Edwards, 1998).

Poor parenting can alter brain chemistry and architecture in ways that reverse positive development, not just for the immediate generation but subsequent generations as well (National Scientific Council on the Developing Child, 2010). Recent work on adverse childhood experiences has noted the influence of risk factors that can be mediated by contingent and sensitive parenting (Felitti & Anda, 2008). Therefore, competent parenting as a protective factor in moderating risk factors has been recognized. Parenting as a characteristic of primates is linked to the evolution of our species and the intergenerational transmission of culture, values and traditions. Undeniably, parents and key caregivers could be considered the foremost and strongest influence on early child development (Shonkoff & Phillips, 2000).

However, parents or caregivers, and families often need support in being able to fulfill their role, especially, if they are burdened by risk factors. The CRC while recognizing that parents and key caregivers have the primary responsibility of rearing children, also recognize that they require assistance in creating those optimal environments for positive child development. As per the CRC, countries are obligated to support caregivers in this role (Hodgkin & Newell, 2007).

Parents who are equipped with the knowledge and skills they need to promote their young child's health and development are a potentially powerful factor in mitigating the risks of poverty. The question then is: what does the empirical evidence say about the efficacy of ECD parenting programmes in LMIC, a part of the world that has received little attention in the scientific literature?

This research paper provides an extensive and rigorous systematic review of ECD parenting programmes conducted in LMIC, addressing the knowledge gap and providing evidence for better programming for children and families.

SUMMARY OF RESULTS

This report reviewed 105 studies of parenting programmes. These studies were operationally defined as activities, programmes, services or interventions, for parents, aimed at improving parenting interaction, behaviors, knowledge, beliefs, attitudes and practices, amongst children aged 0-8 years. These recommendations were intended to improve the children's physical health beyond mere survival, encourage cognitive development, and support their social and emotional well-being.

The systematic review consisted of electronic searches of 10 academic databases (including reference lists in the individual studies identified) as well as searches of the broader grey literature between the years 2001-2011. Herein, we define grey literature as reports not found in academic, peer-reviewed, or published journals. In the academic search, multiple disciplines were explored: medicine and global health, education, psychology, economics and other social sciences. Searches were conducted using broad headings based on the geographical location of the study, the type of intervention, and the kind of evaluation. In the grey literature search, agency websites were systematically explored. Key informant solicitations were conducted to identify unpublished and agency evaluations of ECD parenting programmes. Studies were selected for analysis using the PICO criteria according to population, intervention, comparison (evaluation type), and outcome (Petticrew &

Roberts, 2006). Inter-rater agreement of the screening process was 88% (Cohen's $\kappa=.72$), indicating substantial agreement between the two reviewers. We devised a quality scoring system and selected 105 articles for analysis (out of a pool of 7,086 study titles). We coded articles according to programme characteristics based on their intensity, delivery mode, delivery approach and content, staffing, and types of programme. We included both single-generation programmes designed to directly serve caregivers as well as multi-generational programmes designed to either serve the parent and the child or the entire family. In sum, 36 countries in 7 regions of the world were represented in this systematic review, with 29.5% from low-income countries, 33.3% from lower-middle-income countries, and 37.1% from upper-middle-income countries.

We classified programmatic strategies under two broad ECD programme goals: (i) those that promoted nutrition and health; and (ii) those that promoted holistic outcomes beyond nutrition and health such as cognitive and socio-emotional development. These goals were classified separately since we found that studies conducted in Sub-Saharan Africa and South Asia were more likely to evaluate programmes aimed at improving health and nutrition, whereas studies conducted in Central and Eastern Europe/Commonwealth of Independent States, Latin America and the Caribbean were more likely to evaluate programmes aimed at improving non-health-related child developmental outcomes. Below we summarize key findings, first in terms of child outcomes and then in terms of parental practices.

Child physical wellbeing. Child nutrition and growth were improved through several types of parenting programmes: micronutrient supplementation programmes, nutrition education, and other comprehensive health and nutrition programmes. To reduce the incidence of early childhood morbidities, especially, with respect to diarrhea effective parenting programmes, hand washing and breastfeeding promotion programmes were emphasized. Home visitations, by trained paraprofessionals, are the predominant format among programmes that improve growth or health outcomes. Findings showed that group settings must be combined with other modalities such as individual counseling, distribution of pamphlets etc. Dosage should also be relatively intensive, lasting at least one year. Programmes that aimed improving oral health were didactic and significantly less intensive although preferably, delivered by trained professionals. In terms of developmental timing,

the average age at time of intervention was primarily during the first year of life to the toddler years (12-36 months).

Child cognitive development. Psychosocial stimulation programmes, which entail active engagement between the caregiver and the child, are effective in improving a child's cognitive development. These programmes involved trained paraprofessionals, giving live demonstrations that involved children through play activities that were tailored according to the child's developmental level and the family's individual needs. Although psychosocial stimulation programmes improved cognitive outcomes when targeting impoverished groups, malnourished children still performed well below their non-impoverished counterparts. The average age of children participating in the intervention was around one to three years. In terms of modality and dose, psychosocial programmes are delivered ideally as intensive home visiting programmes or as a combination of group and individual sessions. Programmes delivered as part of home visits ran between one and two years, at weekly, or monthly intervals. There is also strong evidence for combining psychosocial stimulation programmes with early education programmes. There is preliminary evidence that nutritional supplementation alone may be insufficient in improving cognitive outcomes in young children. However, breastfeeding promotion could be an effective strategy in improving cognitive outcomes. This was demonstrated by studying the impact on later cognitive development, of children 6.5 years of age, from families participating in a hospital-based breastfeeding promotion programme.

Child socioemotional outcomes. The frequency of evaluations for this developmental domain was relatively low, despite the recognition that promoting young children's social and emotional well-being is essential in building strong infrastructure for optimal development. Out of the entire analysis, only two programmes evaluated the socioemotional domain. Participation in both programmes resulted in greater interpersonal skills and self-esteem and lesser anxiety and depression. Although no impacts were found for externalizing behaviors (antisocial behavior, hyperactivity, and oppositional behaviors), participation in a programme, during the early years, resulted in lower likelihood of being suspended or expelled from school.

Holistic child outcomes. Studies implemented in five countries demonstrated significant outcomes in more than one child developmental domain. Intervention approaches reviewed involved psychosocial stimulation, integrated health, nutrition, and development interventions, and social protection programmes. The research suggests that effective strategies of improving holistic health and developmental outcomes in children could be in the form of multi-sectoral health and child developmental programmes or intensive psychosocial stimulation programmes. The multi-sectoral health and child developmental programme is efficient and effective in improving a host of child outcomes. The intensive psychosocial stimulation programme entails frequent interactions with caregivers and their children, lasting between one and two years. Across studies, it appears that dose is important and hiring well-trained and supervised paraprofessionals was a cost-effective solution to delivering messages to parents. Malnourished children and younger age groups benefited the most from these programmes. Our analysis also suggests that programmes including fathers, in the training, is a promising and underutilized strategy. These findings are in agreement with studies from higher income countries that demonstrated stronger effects on both child and parenting behaviors when fathers were involved in the programmes.

Parenting Outcomes: Physical health-related caregiving. A total of 20 studies addressed four overarching strategies to promote physical wellbeing by targeting parental outcomes in relation to (1) healthcare seeking behaviors and hygiene practices, (2) oral health practices, (3) nutrition education (alone or integrated with other health-related dimensions), and (4) care practices. Programme evaluations ranged from moderate to large (universal) coverage. Most service delivery modalities combined more than one approach with the exception of two programmes that utilized only a didactic strategy. Delivery settings also varied, with home and community being the most common forms of programme delivery. Data from two studies suggest that interpersonal communication, of contextualized and targeted messages, may positively impact parental knowledge and specific healthcare seeking behaviors. One of the characteristics of the interventions likely to be associated with positive impacts on parents was the specificity of the health-related messages. Interventions that used the local workforce to deliver key messages, suggested that paraprofessionals can impact health knowledge among parents of young children

by themselves or in combination with other professionals. Programmes can be more effective in promoting healthy behaviors if they are built on local research and use contextualized dissemination channels. Improvement in oral health knowledge can be attained through a range of intervention doses as illustrated by the intensity range of the programmes. Interventions utilizing locally available foods demonstrated positive impact in micronutrient intake (for instance, vitamin A and retinol).

The effects of parenting programmes on care practices via antenatal programmes and through a community-based approach were mixed. Results from one of the interventions suggest that more frequent exposure to educational messages through a wide range of channels may lead to greater changes in mothers' care-seeking behavior during the antenatal period. Targeted care and healthcare seeking practices were improved in response to paternal interventions. However, improvements in these practices did not translate into decrease in child mortality rate or changes in child weight. This suggests that more research is needed to understand the mediation of paternal involvement on child outcomes.

Parenting Outcomes: Caregiving beyond physical care. A total of 13 studies demonstrated impacts on caregiving beyond physical care and are categorized as follows: (1) child protection in terms of physical safety and injury prevention, (2) child protection in terms of abuse and neglect, (3) psychosocial stimulation and support, (4) responsive feeding and (5) integrated approaches. Findings from evaluation of physical abuse prevention programmes suggest that group-based programmes are effective and using demonstrations through didactic approaches or via technology were effective strategies to deliver messages. Findings from evaluation of safety and prevention programmes suggest that professionals are effective deliverers of programme messages concerning child safety and also child abuse. It appears that even short-term programmes are effective, although operationalization of safety practices has mostly been based on self-reports. In fact, one study demonstrated that the programme had no impact on performance-based practice. Responsive feeding and integrated programmes were

¹ We acknowledge that responsive feeding is part of nutrition-related caregiving, but here, we focus on the psychosocial component.

also effective programmatic strategies for improving parental practices promoting child development and protection.

Child and Parent Outcomes: Child Developmental Outcomes (Health) and Associated Parenting Practices. Nineteen studies found significant impacts on child physical health and health-related caregiving practices. We found three studies of breastfeeding promotion programmes that impacted both child health and parenting practices. Also, some community-based hygiene and disease prevention programmes utilized available community resources to disseminate health and hygiene information. Community-based education programmes reflected an impact in the reduction of the incidence of disease. These results may be sustained with a higher frequency of exposure to the relevant message. Another important programmatic dimension are health-and-nutrition education programmes. Our review revealed that nutrition education programmes are likely to be more effective if professionals deliver the messages in tandem with the health messages. Moreover, nutrition education programmes that are integrated into existing programmes or structures such as nutrition services or early childhood services are more effective.

We also reviewed data from eight studies categorized under comprehensive health and nutrition programs. A few of the programs reviewed capitalized on available community resources, linking programs to existing policies through multisectoral partnerships, resulting in lower rates of stunting and better parenting practices. From the study findings, there was no added effects for supplementary feeding or food fortification efforts, however, there is some evidence that preventive nutrition programs compared to recuperative (i.e., targeting malnourished populations) ones have greater impacts. Impacts on anthropometry were stronger for children who were exposed to the program when they were younger (6-23 months).

Child and Parent Outcomes: Child Developmental Outcomes (Non-Health) and Associated Parenting Practices. Our review of thirteen programme evaluations revealed that intensive (at least weekly for a period of one year) psychosocial stimulation programmes are effective in changing parental practices and the child's mental, social and

emotional developmental outcomes. But they are not effective in altering psychomotor developmental outcomes and anthropometric measures even when these programmes are integrated into existing nutrition programmes. Psychosocial stimulation studies showed that programmes, which require direct interaction with children, are successful in improving children's information processing skills, language skills, and social and emotional well-being. Additionally, they also improve caregiver practices that promote children's cognitive, social and emotional development. We discuss the longitudinal impact of exemplar programmes and describe its programmatic attributes (two year duration, delivered by certified paraprofessionals, utilizing mother groups) in this review.

Responsive feeding interventions were also assessed for their impact on cognition and developmental outcomes. Analysis of the programmatic models suggest it is important to include children in the session activities and focus on specific practices rather than merely didactic information to maximize impact. Integrated health and development programmes commonly used standardized modules such as WHO's Care for Development. Other programmes utilized more contextualized curricula. Home-visiting was a common modality in the delivery of integrated health and development programmes. In general, programmes were unsuccessful in improving children's psychomotor development, but successful in improving not only children's cognitive and social and emotional outcomes, but also in improving mothers' knowledge and practice of child rearing.

[Studies with no impact or predominantly mixed findings.](#) The review of certain studies have showed either no impact or predominantly mixed findings on the outcomes of interest:

- *Child Health and Parental Health-related Caregiving Outcomes:* Our review of 14 programmatic examples revealed that overall, parental practices do not seem to improve, overall, if the modality is primarily didactic: —lecture-style with no direct interactions with children. Moreover, community empowerment programmes were ineffective in improving health outcomes. Additional modalities and the need to develop solid concrete theory-of-change models, support for paternal inclusion and community approaches like such as home visitations might be necessary. In terms of dosage, low dosage programmes (between 1 and 9 sessions) that are delivered didactically were ineffective.
- *Child Development and Parental Child Rearing Outcomes:* The discussion comprised: three longitudinal follow-up studies, two child protection programmes, and two integrated health and development programmes. Excluding two of the three follow-up studies, the others were evaluations where the delivery of instruction was primarily didactic. The evidence suggests that breastfeeding promotion & psychosocial stimulation programmes have long term impact on cognitive outcomes but not on social and emotional development. Psychosocial stimulation programmes may have long-term impact on social and emotional outcome if they were to be combined with preschool education. The findings also suggest that the development of social and emotional skills and general well-being requires programmes to target these skills directly and over time, in contexts where children have to use them, such as preschool settings.

DISCUSSION AND SUMMARY OF THE RECOMMENDATIONS

Across our review of the literature, we identified three key programmatic areas for existing ECD parenting programmes:

Timing of the Programme. Owing to the rapid changes during early childhood, there are sensitive and critical windows of opportunity, around development, that must be

accounted for when designing parenting programmes. Breastfeeding programmes must commence in the very first moments of a child's life. Psychosocial stimulation programmes ranged from when children were a few months old to 6 year olds. Impacts on anthropometry were stronger for children who were exposed to the programme when they were younger.

Programme Dose (duration, frequency, and intensity): Low dose programmes across duration, frequency and intensity yielded non-significant programme impact. Duration of a parenting programme is linked to the types of outcome. For instance, in order to improve a child's physical health, cognitive development and social and emotional development; the review suggests that 12 months should be the minimum duration of a parenting programme. Programme that lasted over 2 years had a more consistent impact, in particular, amongst the vulnerable and disadvantaged populations. Simultaneously analysis also suggests that shorter duration programmes may work for parent level results (for instance programmes under one year targeting harsh discipline and oral health practices). Moreover, higher frequency parenting programmes were more effective in improving parent and child outcomes. Three important observations regarding the frequency of exposure to the programme emerged: (i) unlike duration, effecting parent or child outcomes requires a similar high frequency; (ii) the frequency of the programme delivery must take into consideration the frequency with which the families apply the learnt lessons; and (iii) the frequency of the programme can be paced or phased-in with more frequent exposure in the beginning. In terms of intensity, or how much of the intervention is delivered in each session, data suggests that more intensive approaches, such as those that include direct interaction with the child, are needed to improve both parenting level outcomes (e.g. the ability of the caregiver to be emotionally responsive) and child level outcomes (e.g. language ability of the child in response to maternal feeding practice programmes).

Programme modality (manner in which the parenting programme was conducted): A strong theory of change must guide the programme's outcomes through the modality or the manner in which the parenting programme was conducted. Our review showed that child cognitive outcomes were significantly improved across both home-based modalities and center-based programmes that used group settings. However, active engagement between the caregiver and the child was key to improving children's cognitive

development. Further, programme outcomes should influence the modality. For example, in the case of parenting outcomes to improve child protection, providing demonstrations or examples of contrasting approaches to safety are effective in informing parental practices. Consistently, programmes that used more than one modality achieved better results than programmes that only used one modality.

Service Provision. There are several programme quality attributes that should be taken into consideration. A primary feature of quality is the identity of the service provider and their ability to deliver the programme effectively. For example, authority figures such as doctors, nurses and educators were among the most successful service providers in improving parenting outcomes. Also, trained local female coordinators with a relatively high level of education were effective in delivering the programme across home and in the group settings. Further, community-based programmes that promote health and nutrition indicate that employing local leaders, such as religious leaders, might be a viable alternative strategy.

Knowledge Gaps and Research Priorities. In reviewing the 105 articles, key findings emerged with important implications for programming. Here, we discuss the knowledge gaps and proposed research priorities based on the review of the literature:

- Social protection programmes, such as cash transfer programmes, are an important mechanism in many countries to reach poor families. Further research is needed to address the feasibility of integrating ECD parenting education into cash transfer programmes. Research is also needed to assess the impact of such integration on improving or mediating the effects of cash transfers on child and parent outcomes.
- Despite the fact that a key determinant of parenting is the caregiver's wellbeing and mental health, limited research addresses this important mediator between

programme and child outcomes. Thus, a key research priority involves programmes that account for the psychological, emotional and mental state of caregivers.

- Much literature is based on small-scale demonstration programmes. It is crucial to address the impact of programmes at a larger scale and characterize their programmatic attributes. In general more research and evidence is needed on the scaling up of ECD parenting programmes.
- Only three studies across the entire review looked at fathers as recipients of parenting programmes. It is crucial to engage the fathers in programme design and evaluation in keeping with a recent report on paternal involvement.
- Attention to the social and emotional outcomes amongst children were limited. Studies examining social and emotional development were a minority.
- It is necessary to strengthen formative research in the field. Little data is available on the role of the “demand-side” of parenting programmes and ways to integrate cultural preferences to the programmes’ designs.
- Metrics for impact evaluation of parenting programmes largely rely on self-report. It is an important research priority to optimize instruments for evaluation as well as diversify the inquiry of potential programmatic impacts (biological outcomes, hormonal and stress outcomes and epigenetic outcomes).
- There is a need to connect ECD programme outcomes to crucial global processes (such as peace building, social transformation, sustainable development, academic achievement). Multidisciplinary and, when possible, longitudinal evaluations are required in LMICs to bolster ECD programming, advocacy and sustainable financing.
- Labor laws, social assistance, and family leave policies may be key mediators to parenting programmes (e.g. food security, time spent at home after birth, maternal decision-making in the home, etc.). Keeping these structural characteristics is important in not only understanding the attributes of the programmes themselves, but also in identifying other entry points for advocacy.

PROGRAMMATIC RECOMMENDATIONS:

Results from the systematic review of parenting programmes in LMIC suggest the following programmatic recommendations:

- **Programmatic goal/s should determine the programmatic strategy.** In the case of child health and physical well-being, several types of parenting programmes such as micronutrient supplementation, nutrition education and comprehensive health and nutrition programmes were effective. Similarly, oral health programmes through education classes for parents and psychosocial stimulation programmes led by professionals and/or trained paraprofessionals were effective approaches.
- **The most vulnerable population and younger age groups benefit the most from ECD parenting programmes.** A majority of the interventions targeted the most vulnerable population. Malnourished children and younger age groups benefited the most from programmes like integrated health and education programmes. Based on these findings, the authors recommend interventions with an equity focus.
- **Programme quantity or “dose” (i.e. duration, frequency and intensity) influences programme benefits.** These factors need to be taken into consideration when designing effective parenting programmes.
- **Multiple programme modalities (manner in which the parenting programme was conducted) – the adoption of several modalities such as demonstrations, practice and problem solving for programming was more effective than using only one modality.** Thus, the use of multiple modalities is the recommended approach to parenting programmes.
- **The quality of service provision matters to the programme’s success.** Strengthening the capacity of service providers are associated with significant positive results and recommended for programme success.

CHAPTER 1: INTRODUCTION

1.1 INTRODUCTION

Parenting approaches, philosophies and cultural constructions abound, but there is one universal tenet: the primary function of parenting is to facilitate the survival, development and well-being of a child. However, this function may not always be carried out in full (due to any number of individual and/or contextual factors), disrupting the mechanism by which positive parenting promotes children's ability to achieve their full potential. The question is: what does the empirical evidence say about the efficacy of early childhood development (ECD) parenting programmes in low and middle income countries (LMICs), parts of the world that have received less attention in the scientific literature?

There is a gap in our knowledge on programmatic evidence on effective parenting programmes. First, much of the evidence on programmatic effectiveness is from high-income countries, where the setting, resources, personal capacities and understandings of programme implementation vary greatly from low and middle-income countries. Therefore, the generalizability of the findings is limited. Second, there is tremendous variation in ECD parenting programme focus, content and service delivery mechanisms thereby creating a challenge in delineation of effectiveness factors. Third, there is little systematic information on the scaling up of parenting programmes, their sustainability and integration into existing systems of service delivery to reach the most marginalized and disadvantaged populations. Finally, literature on the development of parenting programme curricula and content is limited and often does not include "bottom-up" approaches that could promote uptake and sustainability, given that parenting represents the demand side and social norms.

UNICEF is interested in improving the developmental potential of all young children through promoting evidence-based parenting practices. To that end, it commissioned a systematic review of the literature to address gaps in the understanding of what promotes

effective, sensitive and responsive child rearing and caring practices through ECD parenting programmes and interventions in different national, community and local contexts. This report presents the results of a systematic review and identifies effective characteristics and features of ECD parenting programmes and practices.

1.2 PARENTS AND PARENTING

The terms parent and primary caregiver are used interchangeably in this report. The word parent/caregiver refers to the individual or individuals who look after the infant and young child and/or who provide the bulk of the care in a home or family context. Although this definition often assumes the parent/caregiver is the biological parent; foster or adoptive parents, grandparents, stepparents, elder sibling or other adults proximal to the child, may also be the primary caregiver if they provide consistent care to the child (Moran, Gbate and van der Merwe, 2004). Further, some advocate the term parent or parenting to denote long-term family care and therefore parenting embodies past and future perspectives and deep emotional involvement in the rearing and socialization of a young child. In these ways, it is distinguishable from the motives and activities of people involved in short term or professional care of children (World Health Organization, 2004). We use the word parent or caregiver in this review because it is a gender-neutral term and it does not exclude non-biological progenitors.

Parenting can be understood as interactions, behaviors, emotions, knowledge, attitudes, beliefs and practices associated with child health, development, learning, protection and well-being (Yale-AÇEV, 2012²). Western models identify five domains of parenting: caregiving, stimulation, support and responsiveness, structure, and socialization (Bradley, 2004), and their expression is influenced by contextual differences.

² Mother Child Education Foundation (ACEV). <http://www.acev.org/en/anasayfa>

- Caregiving refers to the behaviors and practices of caregivers (mothers, siblings, fathers, child care providers and those who look after infants and young children) to provide food, health care, stimulation and emotional support necessary for children's healthy survival, growth and development (Engle and Lhotska, 1999).
- Stimulation practices are derived from the function of stimulating neurons (Shonkoff and Phillips, 2000). Examples include language interaction (e.g. singing, talking, reading); provision of learning materials and exposure to learning opportunities (e.g., books, magazines), physical interaction (e.g. sports, playing games) and parents' behavior, which serves as a model for children to imitate and emulate (Britto *et al.*, 2002).
- Support and responsiveness, with a foundation in early bonding, are expressed through social and emotional relationships, building trust and attachment and behavioral interactions such as hugging, holding and loving physical contact (Bowlby, 1988). Responsive parenting includes prompt response to a child's behavior that is appropriate to the child's needs and developmental phase (Eshel *et al.*, 2006). Responsive feeding practices have been positively associated with young children's nutrition status (Yousafzai *et al.*, 2013).
- Structure is associated with discipline, supervision and protection of the child from harm, abuse and neglect (Baumrind, 1996). These parenting interactions are expressed through positive disciplinary practices and a safe, secure and consistent environment.
- Socialization relates to parenting that promotes the development of values, attitudes towards life, and identity; it is often an expression of cultural, social and religious morals and expectations (Rogoff, 2003).

Although these domains have been conceptualized individually, they are highly interdependent. Responsive feeding practices involve both caregiving and support while

shared book reading includes both stimulation and responsiveness (Britto *et al.*, 2006). In addition, there is not a one-to-one correspondence between a parenting domain and a child outcome domain. For example, when parents exhibit responsiveness such as hugging and cuddling, they influence their children's emotional wellbeing, foster their development of relationships and shape their biological systems, including nervous and immune system functioning (McCartney and Phillips, 2006). Nutrition feeds the brain, stimulation sparks and strengthens its neural connections, positive health interaction reduces the impact of illness and protection buffers it from the negative impact of stress. The synergy between these dimensions underscores the importance not just of parenting but also of holistic, committed parenting.

1.3 DATA FROM THE MULTIPLE INDICATOR CLUSTER SURVEY (MICS) ON PARENTING

Trends in parenting from LMIC are being captured by the MICS (UNICEF, 2009). The caregiving trends are alarming. For example, only 25% of surveyed mothers with infants less than 6 months of age reported exclusive breastfeeding the previous day, with the upper limit at 57%. This means that, at best, just over half of children in this age range were breastfed (Arabi *et al.*, 2012). Similarly, with respect to stimulation, the MICS₃ results indicate that in the three days prior to the survey, on an average, only one quarter of mothers read to their child, slightly over a third told stories and close to half (47%) engaged in counting, naming and other learning activities with their child (Bornstein and Putnick, 2012). However, mothers reported higher incidences of singing (50%) and playing (64%) with their children during this time. The results in the domain of structure are equally alarming. 66% percent of caregivers reported that, in the month prior to the survey, their child had experienced psychological aggression; 63% reported their child experienced mild physical discipline, while 16% reported an experience of severe physical discipline. Only 18% of caregivers reported that no one in the household had used a violent form of discipline in the previous month (Lansford and Deater-Deckard, 2012).

In conclusion, these results suggest that at best, only half of parents (interviewed through the MICS) engage in parenting behaviors that are considered positive and beneficial for ECD (Britto and Ulkuer, 2012).

1.4 OVERVIEW OF PARENTING PROGRAMS

Parenting support has always existed (e.g. through informal kinship and family networks), but formal recognition of the need to support parents was established through the International Year of the Family in 1994 (UNESCO, 1994). Parenting programmes are typically categorized to include 'family support', 'parent education', and 'parent training'. Sometimes these terms are used interchangeably. However, they don't always overlap. For example, sometimes parent education and support programmes include not only services that help parents in their role but may also include other services such as job training or adult literacy while parent education programmes, could include only parenting education services.

Support for parents comes from a variety of sources, often broadly grouped into informal (from family, friends and neighbors, arising from parents' own pre-existing 'natural' networks), semi-formal (often provided through community-based organizations, and generally by the voluntary sector), and formal support (organized services, often needs-based, and provided by the statutory sector alone or in partnership with the voluntary sector) (Ghate & Hazel, 2002). Although informal and semi-formal support is an important modality, in this review, only formal support programmes were considered for analysis.

The dimensions across which programmes vary can be summarized in terms of Ecological Locus, Developmental Focus and Programme Characteristics reviewed in Claveland, Corter, Pelletier, Colley, Bertrand & Jamieson (2006).

The Ecological Locus refers to how a programme fits into the social systems and community surrounding the child (defined by programme location, target population, who the participants/staff are and how they interact). The Developmental Focus refers to the fact that parent programmes may focus on different developmental domains in children and stages from prenatal to infancy to preschool and transition to school (they may vary in their aim in terms of the parent's development, from specific parenting skills, to teaching skills, to relationship-building, or even empowerment). Some programmes are intended to improve parents' knowledge and practices related to caregiving, nutrition and child health (Aboud and Akhter, 2011), whereas others focus on early education and learning (Kagitçibasi *et al.*, 2001). There are also programmes centered around the reduction of harsh parenting and violence at home (Al Hassan and Lansford, 2011). Some focus on parents with children from birth to 3 years old (Hamadani *et al.*, 2006), but others are designed for parents with children from three years and older (e.g., Johnson *et al.*, 2012). Typically, programmes that focus on the younger age group have a health, nutrition and/or stimulation focus and those for older children have a social, learning and education focus.

Programme Characteristics include intensity (frequency and duration); delivery mode (e.g., face-to-face, group, individual, self-instruction, media), delivery approach and content (e.g., instructional and skills-oriented, constructivist, relationship-building, specificity of content, etc.); staffing (e.g., professional, paraprofessional), and types of programmes (e.g., family literacy, home visiting, behavior management and social development, center-based parent child programmes). Programmes can also be differentiated by the number of generations that are the targetted beneficiaries. Single-generation programmes are designed to directly serve mothers (e.g. breastfeeding programmes) and/or fathers (Cowan *et al.*, 2007), while multi- generational programmes either serve the parent and the child or the entire family (Wasik, 2012). Programmes also differ based on setting: home-based (Mother Child Education Foundation), clinic-based (Needleman, 1991), community- based (Thompson and Harutyunyan, 2009) and others a combination of delivery settings. Programmes can also be differentiated by the degree of standardization within their curriculum. Some follow a very structured curriculum with weekly lessons plans and a

detailed script for the service providers. Others are less formal with discussion topics generated around participant needs and interests.

Our analysis of the literature probed for the Ecological Locus, Developmental Focus, and Programme Characteristics **specified in the programme evaluations**. The operational definition of an ECD parenting programme, in this review, is an *activity, programme, service or intervention for parents aimed at improving parenting interaction, behaviors, knowledge, beliefs, attitudes and practices with children 0-8 years of age, so as to improve their physical health beyond survival, cognitive, social and emotional well-being*.

Lately, parenting programmes have been in the focus, and consequently there is a growing body of related literature. In the late 1990s, the World Health Organization (WHO) review of parenting programmes, "A Critical Link", led to the conclusion that the most effective programmes are the ones that involve parents and other caregivers and focus on children who are in the "critical window" of life and who are most at-risk.

In an extensive review of parenting programmes in low and middle-income (LMIC) countries, 88 UNICEF countries indicated that their country has a "national programme" that promotes good parenting (Lansford & Bornstein, 2007). A further analysis of 40 programmes in 33 of those countries revealed interesting differences across the target participants served, the description of programme content and focus, desired goals and outcomes, the nature of services provided, the service providers, and the location of where those services were provided and the underlying theory of change. These dimensions of the target age of children served (e.g., infants, preschoolers), method of service delivery (e.g., home-based, groups), focus of the programme (e.g., health, nutrition, cognitive stimulation, early-education), and actors sponsoring and implementing the programmes (e.g., state, private sector) have been validated through a review of ECD programmes implemented in LMIC (Britto, Yoshikawa and Boller, 2011). Based on the review by Lansford and Bornstein (2007), 27 of the reported programmes impacted mothers, 22 impacted fathers, and a smaller number of reported programmes impacted children, schools and communities. In most cases the evidence was anecdotal and not scientifically rigorous.

Engle and others (2011) published a review of 11 effectiveness trials and 4 scaled-up parenting programmes across a range of delivery settings, generation of target beneficiaries, curricula and key messages. Their review reports substantial positive outcomes for children (e.g. cognitive, social and emotional development) and two of the programmes report significant improvement in adult parenting knowledge and the home environment.

The parenting literature also covers interventions that are not focused on parenting and yet have improved parenting outcomes. For example, social protection or conditional cash transfer programmes that combine cash and parenting services have demonstrable impact on parenting knowledge and practice (Berhman and Hoddinott, 2005; Macours *et al.*, 2012). Adult and family literacy programmes have also demonstrated positive impact on parent and child outcomes (Padak and Rasinski, 2003).

There are also specific programme models that are being implemented globally, for example, Care for Child Development (WHO/UNICEF) and Mother Child Education Programme (MOCEP/ACEV). *Care for Child Development* package is a holistic intervention that brings together the essential evidence-based components of parenting by aiming to guide the interaction between a caregiver and a child in a family setting thereby improving the caregiving skills of parents and other caregivers. The goal is to strengthen families' knowledge, skills and beliefs to provide the best possible care, stimulation and environment for their children's optimal development. A recent evaluation (conducted in an experimental randomized controlled trial) showed that within an year of implementation, the children of families participating in the programme had better cognitive development, social relationships, emotional bonds and language and communication skills. The mothers were less depressed and the family environment was more positive and stimulating (Petrovic & Yousafzai, 2013). All of these impacts are among the strongest predictors of future health, achievement, and success. The premise behind the Mother Child Education Programme (MOCEP) is that early developmental needs of children must be met and supported by their immediate environment and parents play an important role as "first educators." MOCEP has been developed for families with children 3 to 6 years of age and is implemented through a 25-week programme conducted by ACEV-

trained group leaders,

along with a weekly curriculum for the child that is implemented at home by the mothers. Longitudinal results of the programme have demonstrated sustained benefits in cognitive development, school achievement, school attainment, and socio-emotional development and social integration. Mothers and families also benefited from the programme in terms of better family relations and women's increased intra-family status (Kagitcibasi, Sunar & Bekman, 2001). Both Care for Child Development and MOCEP are being implemented in several countries around the world.

In summary, early childhood development, defined as the period from birth up to eight years of age, is a critical window of opportunity for a child's cognitive, social, emotional and physical development. Appropriate stimulation and support during early childhood result in a range of social and health outcomes in the course of life. Several preconditions must exist to ensure that children get the best start in life and the opportunity to thrive, including effective, sensitive and responsive care of the young child by the primary caregiver, family and community. According to an estimate two hundred million or a third of the world's youngest children do not achieve their potential due to lack of stimulating, nurturing, safe, and responsive caregiving. The importance of caregiving cannot be underestimated for early child development (Engle et al., 2007). However, parents and caregivers need to be supported in fulfilling this role. The results from parenting programmes, across high-, middle and low-income countries indicate significant trends in obtaining positive results for parents and children (MOCEP). However, parenting programmes exist within a complex landscape and represent a myriad of designs, making it difficult to isolate and compare effective mechanisms. Further, evaluations of these programmes have used mixed designs and often not robust evaluation designs. Implementing effective, scaled-up sustainable parenting programmes requires systematic guidance and information on what programme characteristics promote effective, sensitive and responsive child rearing practices, with a special emphasis on the most marginalized families and vulnerable children in support of UNICEF's focus on equity.

1.5 STUDY OBJECTIVES AND RESEARCH QUESTIONS

The overarching aim of the current study is to identify the most effective approaches and delivery mechanisms of parenting programmes with a special focus on the most marginalized families and vulnerable children. This focus is in tandem with UNICEF's equity approach in order to provide evidence for better programming in a global context. Given the aims of the study, a systematic review methodology was considered appropriate and relevant.

Systematic review methodologies were developed to overcome the biases that are intrinsic to traditional literature reviews. A systematic review is an exhaustive or comprehensive review of the current published and unpublished literature using a set of predetermined criteria and procedures. Systematic reviews are particularly useful for topics where there is a vast amount of information and many publications. The systematic review methodology provides a tool for the summary and analysis of the respective literature to answer a set of specific research questions. A systematic review is considered a research method unlike a traditional review that merely discusses the literature. A systematic review follows a study protocol to analyze the literature to respond to specific research questions (Petticrew & Roberts, 2006).

According to the Campbell Collaboration (2010), a systematic review could be considered an evidence-based tool that uses transparent procedures to find, evaluate, and synthesize the results of relevant research. These procedures are designed in advance, similar to other research design studies, so that the review study can be replicated. Further, the literature is screened for relevance and quality based on a set of predetermined criteria to reduce bias. The following components are recommended by the Campbell Collaboration for a systematic review study: (i) an explicit search strategy; (ii) clear inclusion/ exclusion criteria; and (iii) systematic coding and analysis of included studies. The aim of this systematic review, in particular, is to synthesize and analyze models of ECD parenting programmes to discern the effectiveness factors that improve parenting and child

outcomes, with a special focus on the most marginalized families and vulnerable children, in a global context. The study was designed to:

- Provide an overview of available evaluation-based evidence of parenting programmes, including the most marginalized;
- Map out and categorize existing programmes that improve parenting (scope, coverage, delivery channels, partners), including achievements, constraints and lessons learned;
- Identify the most effective approaches and delivery mechanisms;
- Improve understanding of the context in which parenting programmes work/operate most effectively;
- Distil lessons learned and good practices by analyzing what works and what does not work (and why) in various aspects related to planning, management and implementation of parenting interventions.
- Identify which programmatic features such as programme dosage, programme modality, service provision, and timing can lead to a theory of change for effective programming.

1.6 BRIEF DESCRIPTION OF CHAPTERS IN THE PRESENT REVIEW

The overarching goal of this systematic review is to synthesize extant research on early childhood parenting programmes in low and middle-income countries (LMIC), where the need for such programmes is high given gross impoverishment in these global areas. The report is divided into four main chapters:

- Chapter 1 provides the contextual framework for this report. It begins with an introduction to parenting followed by a definition of key concepts, the current status and overview of parenting programmes, the study objectives and research questions.

- Chapter 2 elaborates on the methodology used in the systematic review. It includes the search strategy, inclusion criteria, and protocol for screening data.
- Chapter 3 presents the systematic review results for LMIC, based on descriptive results and programmatic results, for child and parent outcomes.
- Chapter 4 discusses the key findings of the review of parenting programmes based on what constitutes effective, sensitive and responsive child rearing and caring practices through ECD parenting programmes. It also discusses the interventions as well as the knowledge gaps and future research priorities.

CHAPTER 2: STUDY METHODS

2.1 LITERATURE SEARCH

The literature on ECD parenting programmes is vast and is covered in both academic and non-academic resources. Therefore, we conducted a systematic review of ECD parenting programme evaluations in LMIC beginning with a three-prong search strategy using a set of predefined constructs, keywords, and discipline-specific vocabulary. First, we conducted electronic searches of the academic literature (namely, peer-reviewed journals and reviews of reference lists in the studies identified) within 10 databases. Multiple disciplines were explored including medicine and global health (Medline, EMBASE, CINAHL, Global Health), psychology (PsycINFO), social sciences (SSCI, IBSS, and Social Services Abstracts), economics (EconLit), and education (ERIC). Searches were conducted using broad headings for geographical location of the study, type of intervention, and type of evaluation (Glover & Odat, personal communication). Search strings were adapted to the different databases, but generally the searches included: (child* or early child* or early intervention or early learning or young child* or girl child* or child care) OR (parent* or father* or mother*) in conjunction with a proximity operator followed by (guid* or train* or education or behav* or programme* or intervention or relation*) OR (famil* or extended famil* or caregiv* or grandfather* or grandmother* or grandparent* or sibling* or brother* or sister*) AND (programme* or interv* or train*).

Second, to reduce potential effects of publication bias, the broader grey literature was searched through a systematic exploration of agency websites (Table 1).

Table 1: Systematic review of agency websites

Agency Type	Agencies Searched
<i>Multilateral agencies/organizations</i>	UNICEF, UNESCO, United Nations Population Fund, United Nations World Food Programme, World Bank, Inter-American Development Bank, Asian Development Bank, African Development Bank, Save the Children, Plan International, World Vision
<i>Foundations and initiatives</i>	Aga Khan Foundation, The Gates Foundation, Bernard Van Leer Foundation, Clinton Global Initiative
<i>Relief organizations and committees</i>	International Committee of the Red Cross, Inter-Agency Network for Education in Emergencies, International Rescue Committee, Medicine Sans Frontiers, Center for Disease Control
<i>International centers of expertise</i>	Human Sciences Resource Council, Association for the Development of Africa, Young Lives, Parenting in Africa, Food Science Central - IFIS Journals, ECD Virtual University

Electronic searches were conducted within websites of agencies and organizations known to be active in the area of ECD, parenting, and human development. Combinations of several search terms were adapted to each agency website (Table 2)

Table 2: Commonly used terms in agency website searches

Exaction terms and phrases	
"parent education" "programme evaluation"	Health Topic: Maternal and Newborn Care
"parent education" evaluation	Health Topic: Maternal and Newborn Care and KW: evaluation
"parent education" literature review	longitudinal study parenting
"parent programme"	parent education
"parent training"	parent education research
"parent training"	parenting
early childhood education	parenting "literature review"
early childhood evaluation	parenting "programme evaluation"
early childhood interventions	parenting analysis
early childhood parenting evaluation	parenting education
early childhood programmes	parenting interventions "literature review"
family life education	parenting programme analysis
family programme evaluation	parenting programme evaluation
Health Topic: Maternal and Newborn Care and KW: evaluation	research parenting interventions

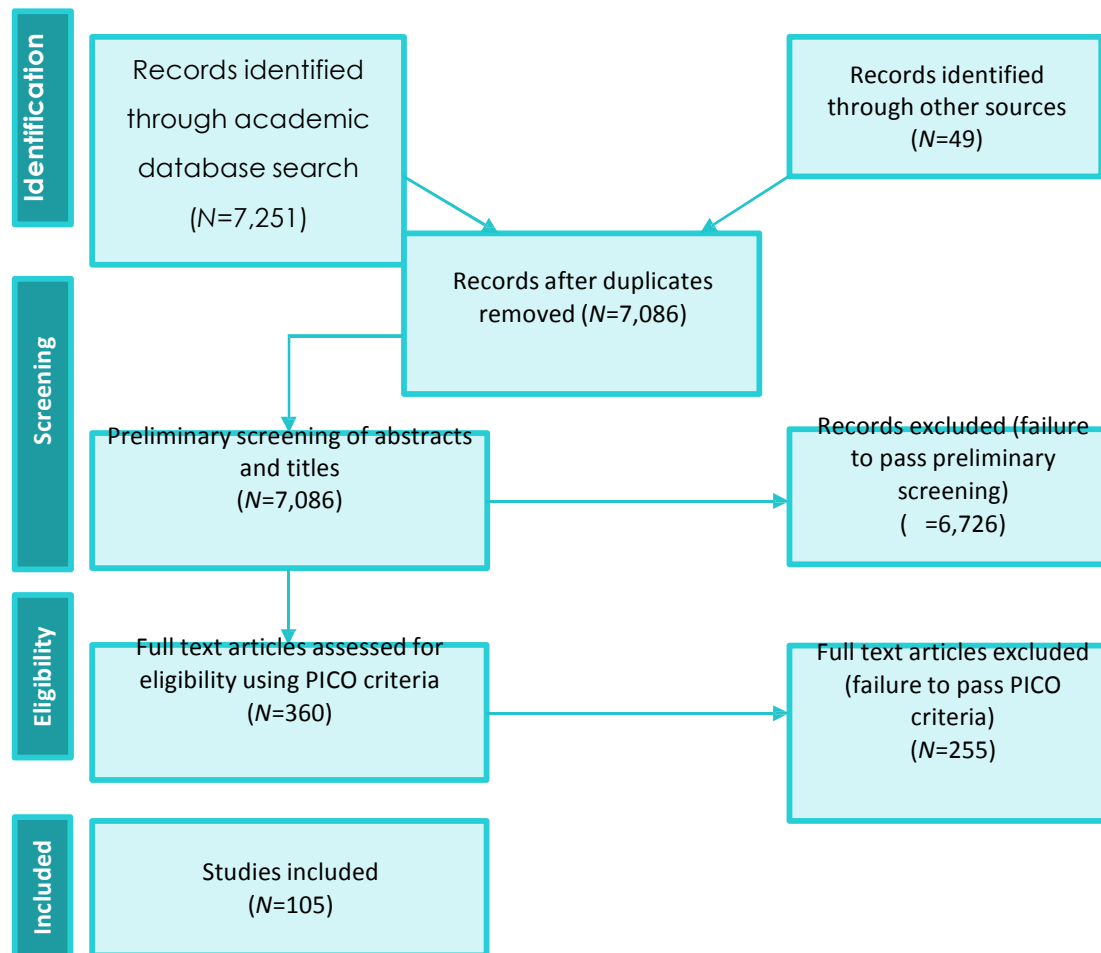
Third, key informant solicitations were conducted to identify unpublished and agency evaluations of ECD parenting programmes (Table 3). A standardized solicitation email was sent to Programme Officers at UNICEF country and regional offices, multilateral agencies, foundations, agencies, regional networks, and associations.

Table 3: List of key informant solicitations

Agency Type	Agencies to where solicitation was sent
<i>Multilateral agencies/organizations</i>	<p>UNICEF Regional Offices: TACRO, EAPRO, ESARO, CEE/CIS, ROSA, WCARO, MENA; UNICEF Programme Offices: Child Protection, Health, Nutrition, Education, HIV/AIDS, Evaluation Office.</p> <p>World Bank, Plan International, World Vision, Save the Children, Association for the Development of Education in Africa – Working Group on Early Childhood Development, Division for Social Policy & Development, Child Fund International</p>
<i>Foundations</i>	<p>Bernard van Leer Foundation, Open Society Foundations - Early Childhood Programme, ACEV (Mother Child Education Programme, Aga Khan Foundation)</p>
<i>Regional networks and associations</i>	<p>Better Care Network, ECD Consultative Group, International Centre of Education and Human Development (Latin America), Asia Pacific Regional Network for Early Childhood, Arab Resource Collective, European Early Childhood Education Research Association, International Step by Step, European Association on Early Childhood Interventions</p>

Figure 1 summarizes the three search stages and data sources explored in this review. Searches and key informant consultations were performed during July/August 2011.

Figure 1: Systematic Review Search Stages and Data Sources Explored



2.2 SCREENING CRITERIA FOR RELEVANCE AND ELIGIBILITY

As a preliminary method for screening, we assessed study eligibility by publication date, publication type and language. Only academic studies published after 2001 were included in order to narrow the analysis to recently published studies. Documents such as editorials and notes, dissertations, letters, case series, conference papers, and book

chapters that emerged from the academic searches were excluded. Within grey literature, only reports published from 2006 onwards were searched and screened in order to limit the large volume of hits that could not be filtered through a centralized database. Publications in English and Spanish were included for review.

Following the preliminary method for screening, next, the obtained studies were selected for analysis using the PICO criteria according to population, intervention, comparison (evaluation type), and outcome (Petticrew & Roberts, 2006):

(1) Participants and populations: To be considered for inclusion, programmes must have targeted caregivers of young children (0-8 years of age) who live in LMIC as classified under the 2009 World Bank country income classification (<http://data.worldbank.org/about/country-classifications>). Single generation programmes that targeted the adult caregiver in the family (including parents, grandparents and non-traditional caregiver such as elders in the community, grandparents, and/or older siblings) and two-generation programmes that targeted both the caregiver and the child were considered for review. We included populations characterized both by biological risk (i.e., children with reversible physical disabilities such as low birth weight) and environmental risk (i.e., children exposed to toxic environments that can negatively impact their developmental outcome such as poverty) [The Consultative Group on Early Childhood Care and Development, 1998]. However, we excluded programmes that targeted populations characterized by established risk (i.e., children with irreversible congenital disabilities) and psychopathology because of the lower generalizability of these interventions.

(2) Intervention: We included programmes that targeted explicitly at least one of the following dimensions of parenting: caregiving, stimulation, support/responsivity, structure and socialization. We excluded programmes that (i) consisted solely of mass media with no evidence of explicit parental instruction; (ii) targeted only mother's empowerment and/or mental health but not caregiving practices; (iii) targeted caregivers during the prenatal period only. These exclusion criteria were applied because we wanted to assess the effects of programmes where parenting practices were explicitly targeted, parenting interactions

could be observed, and sustained parenting practices aimed at. For instance, we included parenting support programmes with a parenting education component as in conditional cash transfer programmes that required attendance at parent training workshops.

(3) *Evaluation design*: To assess ECD programme effectiveness, first, we included impact evaluation studies from both the academic and grey literature that contained pertinent statistical data. A meaningful comparison group must have been available, either in the form of control groups (experimental designs), comparison groups (quasi-experimental designs), or within-groups (pre-post-test designs). In addition, the evaluation had to contain at least 100 participants for robustness and generalizability (Terwee *et al.*, 2012).

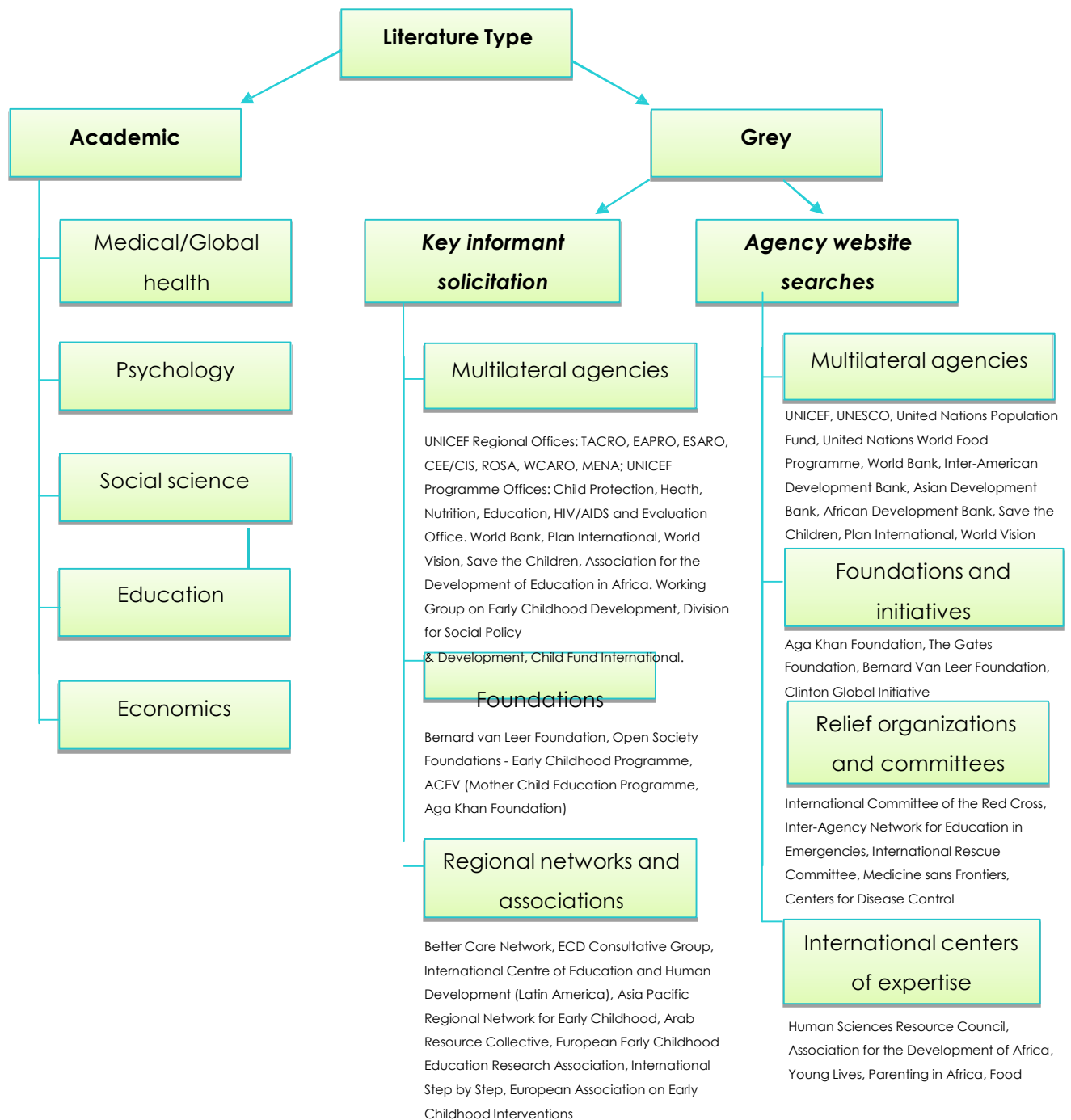
(4) *Outcomes*: To be included in the review, the evaluation had to assess at least one child or one parental outcome (or both). Child outcomes included health and physical well-being, cognitive development, and social-emotional development. Parental outcomes included knowledge, attitudes, practices beliefs, and parental efficacy. Programmes that evaluated only rates of immunization and prevalence of breastfeeding were excluded because systematic evaluations of these outcomes have been reviewed elsewhere (Bhutta *et al.*, 2010). Moreover, programmes that evaluated only the effects of parenting programmes on child mortality were excluded because we were interested in programmes that improved other dimensions of child development beyond survival rates.

2.3 SCREENING PROCEDURES

Search results from academic databases and hand searches of reference lists were imported into a reference management programme (Endnote X4) where duplicates were removed. Primary screening of academic literature involved four reviewers screening 7,086 study titles and abstracts from the search results. Out of the screened titles and abstracts, 6,726 studies were excluded immediately for failing to meet inclusion criteria (e.g., not an

ECD parenting programme evaluation, not conducted in LMIC, or wrong publication type). Final screening involved two of the systematic review authors assessing independently each of the remaining 360 full-text articles. Inter-rater agreement was 88% (Cohen's $\kappa=.72$), indicating substantial agreement between the two reviewers. Contested articles were further discussed by applying PICO and final decisions were then made. Of the 360 articles that were preliminarily included, 98 articles from the academic databases passed final screening for inclusion into the systematic review. In addition to the articles obtained from the academic databases, agency reports that met the inclusion criteria were also reviewed. For the impact evaluations, seven articles from the grey literature met criteria for eligibility to assess programme impacts, totaling 105 articles included in the systematic review (98+7). No systematic differences in terms of study quality were found between academic and grey literature articles (to be discussed in detail in the following section). Figure 2 describes the literature types that were explored and the search strategies applied.

Figure 2: Compendium of systematic review resources: Literature types explored and search strategies applied



2.4 DATA EXTRACTION

A total of 105 articles (from both academic and grey literature) were included for data extraction and analysis. Coding sheets were used to standardize data extraction. Extraction categories included the programme approach (e.g., psychosocial stimulation, nutrition education), delivery setting (e.g., primary health care, community center), delivery format (e.g., home visits, group lectures), programme components (e.g., use of print, live demonstrations, direct interactions with child), programme implementer (i.e., professional or paraprofessional), dosage, evaluation method (i.e., random or non-random), and outcome categories. We contacted study authors to fill in missing data whenever possible. Two readers coded 85% of the articles and attended weekly meetings to discuss coding procedures and challenges. The remaining articles were coded by two of the authors of this report, who also reviewed the rest of the coded articles. To ensure inter-coder reliability, 15% of the studies were double-coded (Cohen's $\kappa=.76$). Discrepancies were discussed during the weekly meetings. The study authors determined codes of contested articles.

2.5 STUDY EVALUATION

In the first phase of the systematic review, the first step in evaluating each study was to assess its quality (i.e., the study's merits and potential for generalizability and its relevance to ECD programming in LMIC). We devised a quality scoring system that we adapted from a criteria devised by outside experts. (Jadad *et al.*, 1996; Terwee *et al.*, 2012). Our criteria consisted of five broad categories: (1) *study design* (i.e., participants randomly assigned to condition; presence of control/comparison group; at least one pretest and one posttest; explicit mention of double blinding; data collectors blind to intervention), (2) *sample* (i.e., at least three descriptions of the sample; initial equivalence between groups assessed; comparison/control group matched with programme group at baseline with respect to demographics; comparison/control group matched with programme group at baseline with respect to outcomes being assessed; sample attrition below 20%), (3) *programme implementation* (i.e., use of an established course of parenting as evidenced by authors'

report of a curriculum or training manual; assessed fidelity to intervention; training of parent trainers described), (4) *outcome measures* (i.e., used standardized or objective measures of at least one of the outcome variables of interest; post-intervention scores tested more than once; effect sizes reported), and (5) *cultural responsiveness* (must have checked at least one of the following: materials translated into local language; programme practices/materials consistent with—or adapted to fit with—local context, culture, or religion; programme ownership given to local community). Coders assigned 0 and 1 for each item (total 17 items), where higher scores meant higher quality ratings. We calculated percentages to make up the quality score for each study ($M=59.12\%$, $SD=16.45$). No significant difference in quality scoring percentages were found between studies derived from academic databases ($M=59.50$, $SD=16.74$, range=14.29-94.12) and grey literature ($M=53.73$, $SD=11.13$, range=38.46-68.67), $t(103)=0.90$, *ns*.

The second step in evaluating findings in each study was to determine if the programme had a significant impact. We set the significance level at $p<.05$ to remain consistent as few studies considered $p<.10$ as significant. Whenever a study reported significant differences between study participants and non-study participants (i.e., normal population who were not in the study comparison group), we used available data from the article to determine statistical significance between programme participants and their corresponding control/comparison participants.

2.6 PUBLICATION BIAS

Given the nature of our study, it is highly probable that evaluations of ECD parenting programmes in LMIC were conducted but never published in peer-reviewed journals. We addressed this issue using three strategies. First, as mentioned previously, we included studies obtained from the grey literature if they met our standards for inclusion. This approach casts a wider net of studies that may otherwise not have been found using traditional academic search strategies. Second, we included studies published in Spanish to expand the number of hits. Given that ECD programming is growing rapidly in Latin America (Vegas

and Santibáñez 2010), including studies published only in Spanish lessens the bias in reporting results published only in English. Finally, we included in our results a section on studies that showed either no significant impact or predominantly mixed findings on the outcomes of interest. Altogether, these strategies, albeit imperfect, increase the generalizability of our findings.

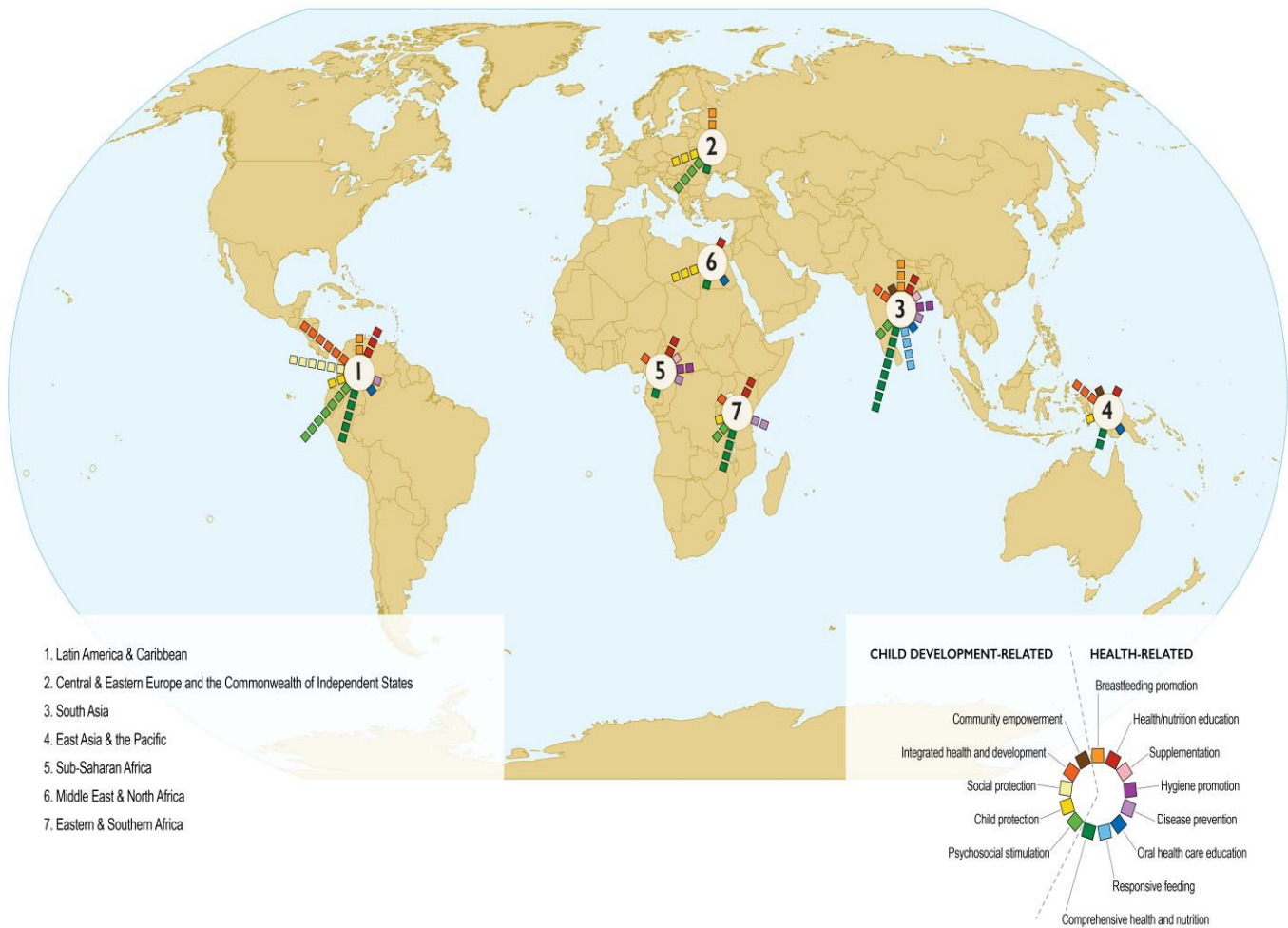
CHAPTER 3: RESULTS

The 105 articles reviewed in this study provide a range of results with implications for improving the effectiveness of ECD Programmes and areas where we have knowledge gaps that need to be addressed by future research. Results are presented in two sections. First, we provide a descriptive overview of the studies with information on geographic region of the world, where the Programmes are being implemented, and common Programme foci and modalities. In the second part of this chapter, we discuss the results by outcome domains where significant differences were found.

3.1 DESCRIPTIVE RESULTS

This section presents results of our findings. Thirty-six countries in seven regions of the world were represented in this systematic review: with 29.5% from low- income, 33.3% from lower-middle-income, and 37.1%, from upper-middle-income countries, respectively. About a third (31.1%) of the studies were conducted in Latin America and the Caribbean (Argentina, Belize, Brazil, Haiti, Jamaica, Mexico, Nicaragua, Paraguay, Peru, and St. Lucia), followed by over a quarter (25.7%) in South Asia (Bangladesh, India, Nepal, and Pakistan), 11.4% in Eastern and Southern Africa (Ethiopia, Madagascar, Malawi, South Africa, Swaziland, Uganda) 9.5% in Central and Eastern Europe (Armenia, Belarus, Turkey), 8.6% in East Asia and the Pacific (China, Philippines, Thailand, Vietnam), 7.6% in Sub-Saharan Africa (Burkina Faso, Gambia, Niger, Nigeria, Senegal), and 5.7% in the Middle East and North Africa (Egypt, Iran, Jordan, Syria).

Figure 3: Programme classification across the different regions of the world



The studies evaluated between 100 and 75,000 individuals (median=470). Of the 105 evaluations, 60% ($n=63$) employed random assignment (9.5% of which assignment was into different programme group without a control group), 28.3% ($n=30$) employed non-random assignment (quasi-experimental design with comparison group), and 11.3% ($n=12$) employed within-subjects design (or no control group).

As described above, we classified programmatic strategies under two broad ECD programme goals: (i) those that promoted nutrition and health; and (ii) those that promoted holistic outcomes (such as cognitive, psychosocial etc.) beyond nutrition and health. The rationale for this classification is linked with the reality of Programme implementation and representation of the Programme evaluation. Most services for

families with children under 3

years of age are implemented by the health sector. These Programmes tend to focus on health related outcomes. Second, the literature on ECD parenting was broadly divided into Programmes that addressed health and nutrition needs and Programmes that addressed other domains of development. Therefore this classification represents the distribution of Programme focus noted in the literature.

ECD parenting programmes that aimed to promote nutrition and health (56.2%) consisted of breastfeeding promotion, health/nutrition education, micronutrient supplementation, hygiene promotion, disease prevention, oral health care education, responsive feeding, and comprehensive health and nutrition. Comprehensive health and nutrition programmes were a combination of any of the mentioned approaches that aim to improve nutrition and health. These programmes may include growth monitoring, food fortification, and health education, for example the *Integrated Management of Childhood Illnesses*, an integrated approach to child health that focuses on the well-being of the whole child with a primarily health driven focus.

In addition to programmes that aim to promote nutrition and health, other programmes aimed to promote domains of child development other than health (43.8%). These included psychosocial stimulation, child protection, social protection (as in conditional cash transfer programmes). In this category we also included Programmes that integrated health with development, i.e., programmes that combined health aims with non-health child developmental aims.

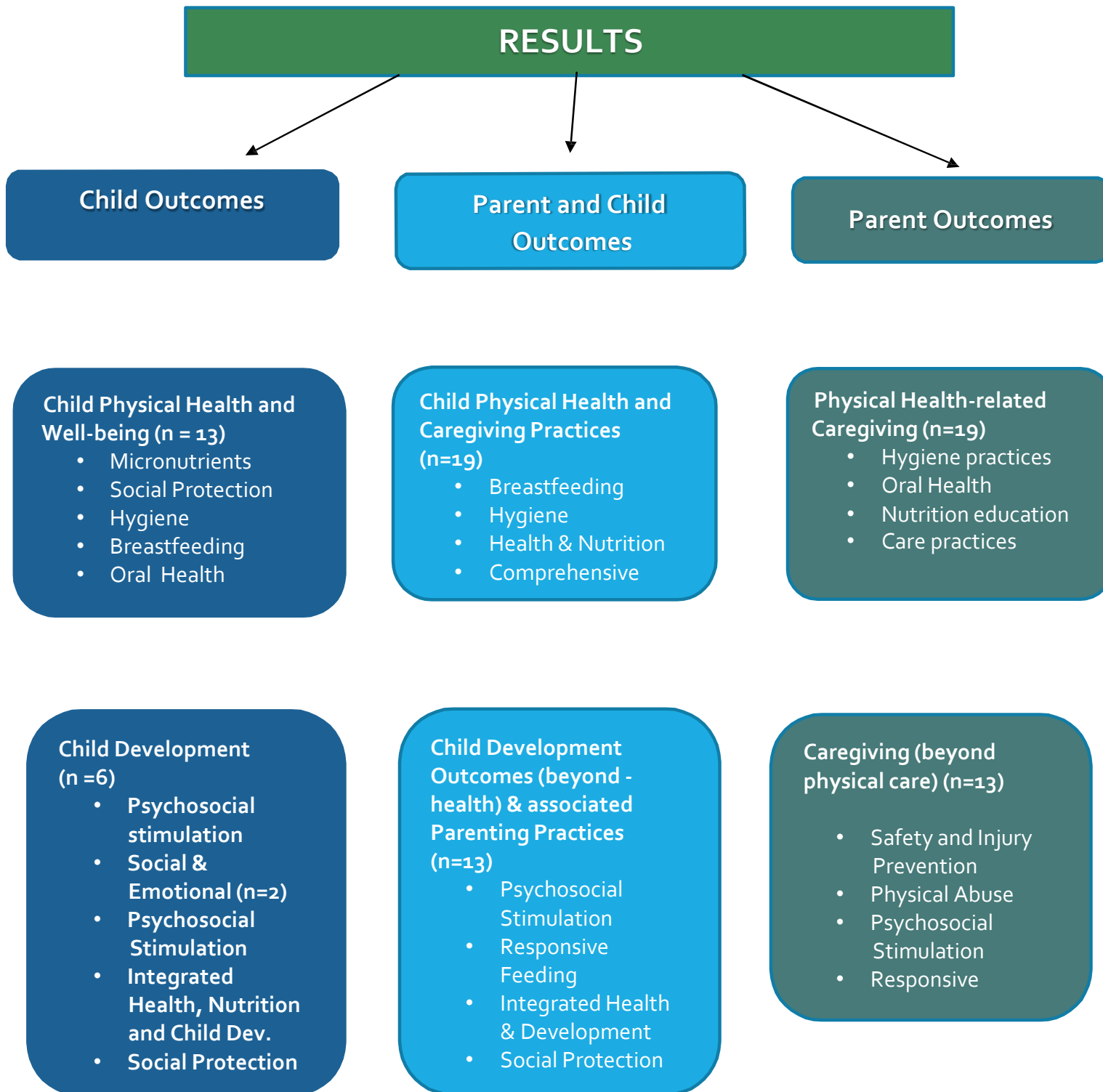
Certain regions of the world stressed one programmatic aim over the other, $\chi^2(6)=19.39$, $p=.004$ (see Figure 3). Studies conducted in Sub-Saharan Africa (87.5%) and South Asia (81.5%)—regions where food insecurity and malnutrition are predominant—were more likely to evaluate programmes aimed at improving health and nutrition, whereas studies conducted in Central and Eastern Europe/Commonwealth of Independent States (70.0%) and Latin America and the Caribbean (63.6%) were more likely to evaluate programmes aimed at improving non-health-related child developmental outcomes.

3.2 PROGRAM RESULTS BY CHILD AND PARENT OUTCOMES

We now present results by outcome domains: (1) child outcomes (physical well-being, cognitive development, social and emotional development, holistic development), (2) parent outcomes (knowledge, attitudes, and practices related to health-related caregiving, caregiving beyond physical care, and a combination of health- and non-health-related caregiving), and (3) both child and parent outcomes (i.e., comprehensive outcomes). (Figure 4). Programmatic details such as approach, delivery format and setting, dosage, and implementer are discussed. The final section will present results of evaluations that found no impact or predominantly mixed findings.

We are presenting results separately for single generation outcomes and two-generation outcomes because the theory of change underlying these models differ. Programmes that focus on single generation outcomes may or may not employ a family focused ecological approach, as discussed in chapter 1. Furthermore, the role of parents in mediating change in child outcomes, is viewed differently when only children are the focus of the intervention compared to when both parents and children are the focus of the intervention. Finally, the modality, dose and aim of Programmes that target child or parent outcomes are often different from those programmes that aim to impact both the child and the parent.

Figure 4: Results chart



3.2.1 CHILD OUTCOMES

Child outcomes are categorized in terms of the following domains: physical well-being (i.e., growth/anthropometry, morbidity, oral health); cognitive development (i.e., information-processing ability, psychomotor development, language development, and academic achievement and performance); social and emotional development (i.e., internalizing problems, externalizing problems, and social adjustment); and holistic outcomes (i.e., a combination of outcomes across two or more domains). Twenty-seven studies were included in this section.

3.2.1.1 Child Physical Well-Being ($n=13$)

In this section, we present an analytical summary of ECD parenting programmes that aim to improve child physical well-being (See Table 4 in Appendix 1). The studies evaluated between 241 and 2,764 children (median=906), spanning across nine countries: four from India, two from Pakistan, and one each from Brazil, Iran, Malawi, Mexico, Niger, South Africa, and Vietnam. The following programmatic approaches were used: (1) micronutrient supplementation, (2) hygiene promotion, (3) breastfeeding promotion, (4) comprehensive health and nutrition, (5) oral health care education, and (6) social protection.

Micronutrient Supplementation Parental practices that promote micronutrient intake during the early years are crucial for appropriate growth and adequate physical, motor, and cognitive development. Micronutrient deficiencies resulting from malnutrition may lead to irreversible effects on brain development and other functional outcomes (Lozoff, Beard *et al.* 2006). Common and related anthropometric measures to assess delays in growth trajectories include stunting (height-for-age $z < 2$), wasting (weight-for-height $z < 2$), and underweight (weight-for-age $z < 2$) (Cogill, 2003). Stunting in early life is associated with impaired health, educational performance, cognitive development, and school achievement (Dewey and Begum, 2011). Wasting often reflects short-term malnutrition

(Richard, Black et al. 2012). Underweight is a strong predictor of mortality among children under five years of age (UNICEF 2007). One other measure in assessing nutritional development and status of developing children is linear growth retardation, which indicates long-term exposure to nutritional deprivation (Allen 1994).

Among the studies reviewed, micronutrient fortification/ supplementation programmes improved growth and anthropometric measures of children (Bhandari, Bahl *et al.* 2001; Gaboulaud, Dan-Bouzoua *et al.* 2007). One large-scale therapeutic rehabilitation programme in Niger sought to reduce severe malnutrition in children aged 6-59 months (Gaboulaud, Dan- Bouzoua *et al.* 2007). In this study, ready-to-use therapeutic foods (RUTF) were distributed in households, weekly, where parents were instructed to provide three daily meals and two additional packets of the RUTF. Meal preparation demonstrations were organized for mothers at follow-up home visits for those assigned to the home visiting group. In India, assignment either to the supplementation group or nutritional education group resulted in greater weight gain in either intervention relative to the control groups (Bhandari, Bahl *et al.* 2001). Both programmes were implemented during the toddler years (between 12-36 months), on average, and both programmes employed primarily didactic instruction to increase weight gain. Dosage varied across both studies.

Social Protection Social protection programmes such as conditional cash transfers have been shown to improve growth and anthropometry. The parenting education component of such programmes was less explicit although it was included in the programmatic strategy. Conditional cash transfer programmes provide monetary aid to families under a contract or set of conditions (Lindert, 2005). The conditional cash transfer programme in Mexico called PROGRESA targeted rural areas and was expanded to urban areas under a new name, *Oportunidades* (Levy, 2006). It included the distribution of micronutrient fortified food with health services and cash transfer tools (Rivera, Sotres-Alvarez *et al.* 2004). From an equity perspective, the PROGRESA evaluation is important because the nutritional component of the programme is intended for low-income households in underprivileged communities of South Central Mexico. In our review of the academic literature, evaluation of the Mexican programme appeared as the only model of conditional cash transfers that targeted nutritional

practices and that provided parenting education for caregivers of young children. The evaluation of the programme demonstrated that children who were eligible for and enrolled in the programme had an improved growth advantage. In particular, the evaluation found that the effect on height was stronger in infants younger than 6 months at baseline who lived in the poorest households. The parenting education component consisted of mandatory sessions on pre- and postnatal care as well as nutrition and health education in addition to mandatory immunization and well-baby care and growth monitoring sessions.

Hygiene Promotion In terms of morbidity, prevalence of diarrheal disease is often included as a primary outcome of interest. Diarrheal disease is a significant health burden causing an estimated 1.3 million deaths each year in children younger than five years of age (Black, Cousens *et al.* 2010). Long-term effects of diarrhea include decreased physical fitness, delayed school entry, and poor school performance (Guerrant, Kosek *et al.* 2002). Although causes of infectious diarrhea vary, in LMICs, pathogen transmission occurs primarily through contact with contaminated water, viruses, and bacteria, often leading to fluid loss, dehydration, and malnutrition (Santosham, Chandran *et al.* 2010; Alkizim, Matheka *et al.* 2011). Interventions that prevent the transfer of pathogens (i.e., hygiene promotion such as hand-washing), increase immunity (i.e., breastfeeding promotion), and promote the timely use of treatments (i.e., oral rehydration therapy, zinc supplementation) are critical to reducing morbidity and mortality associated with diarrheal diseases among newborns, infants, and young children (Bajait and Thawani, 2011; Lamberti, Walker *et al.* 2011).

In Pakistan, the hand washing promotion intervention consisted of three components: demonstrations, discussions before and during the intervention, and posters as rewards for households using soap (Luby, Agboatwalla *et al.* 2004). Results favored the intervention groups (families supplied with either regular or antibacterial soap) over the control group with respect to reduction in the prevalence and severity of diarrhea. No differences were noted with either intervention group, suggesting that promoting the use of either regular or antibacterial soap is an effective strategy in reducing diarrheal disease in young children.

Breastfeeding Promotion and Comprehensive Health and Nutrition Our findings revealed that other than hygiene promotion programmes, breastfeeding promotion programmes have been shown to lower the rates of diarrhea (Bhandari, Bahl *et al.* 2003) and other neonatal or early childhood morbidities (Sripaipan, Schroeder *et al.* 2002; Bang, Baitule *et al.* 2005). Moreover, breastfeeding promotion programmes have been found to be effective in improving anthropometric measures when breastfeeding promotion is combined with other intervention approaches such as caregiver support (le Roux, le Roux *et al.* 2010) or other forms of comprehensive health approaches (Sripaipan, Schroeder *et al.* 2002; Saleemi, Zaman *et al.* 2004; Bang, Baitule *et al.* 2005; Bang, Bang *et al.* 2005; Kalimbira, MacDonald *et al.* 2010). For instance, the Philani intervention in South Africa stressed the role of respectful and caring relationships between Mentor Mothers and caregivers in addition to providing home-based counseling (le Roux, le Roux *et al.* 2010). Indeed, the dynamic, rapport, and personal connection between caregivers and programme providers are key ingredients to programmatic success (Forry, Moodie *et al.* 2011). Elsewhere, one large-scale home-based neonatal care programme in India provides services to pregnant women who receive health education on thermal care, prevention and management of infections, management of neonatal sepsis, and health-seeking behaviors in addition to breastfeeding (Bang, Baitule *et al.* 2005; Bang, Bang *et al.* 2005). Among breastfeeding promotion programmes, the primary delivery format was home visits and programme dose was generally intensive, lasting at least up to one year. In India, local village workers belonging to the Integrated Child Development Services scheme, the largest multi-sectoral maternal and child health and nutrition programme in the world (Kapil 2002), auxiliary nurse midwives who ran immunization clinics, and other healthcare providers (IMCI-trained) visited mothers with low literacy levels, monthly, for one year; this was supplemented with monthly neighborhood meetings to reinforce the breastfeeding messages led by community representatives (Bhandari, Bahl *et al.* 2003). In Pakistan, monthly home visits lasted up to 2 years (Saleemi, Zaman *et al.* 2004). Across these studies, trained paraprofessionals delivered the intervention.

Oral Health Care Education has not been a major area of inquiry in the early childhood literature in LMIC even though it is a key component of overall physical well-being. In this review,

two studies that examined oral health outcomes in young children were conducted in Iran (Mohebbi, Virtanen *et al.* 2009) and Brazil (Pereira and Freire 2004). Whereas both programmes found improvements in the incidence of dental caries, programme modalities differed. In the Iran study, the strategy included either delivery of pamphlets with information on feeding habits, sugar intake, bacteria transmission, and oral hygiene (“pamphlet group”), and/or three bi-monthly phone calls delivered during a 6-month period reminding parents of the oral health instructions delivered by clinic staff (“pamphlet + reminder”). While the pamphlet + reminder group had fewer children with dental caries than the control group, the pamphlet-only group did not differ with the control group, signifying the frivolity of handing out pamphlets in improving oral health outcomes. In the Brazil study, parents attended three weekly sessions on oral health education delivered by trained dentists and hygienists, which resulted in a decrease in the number of children classified under the high caries risk group. What was common between the two studies was they were both delivered didactically to individual parents and were of low dose (three sessions or reminder calls).

Summary Among studies that reported significant child physical well-being outcomes, our findings revealed that child nutrition and growth are improved through several types of parenting programmes: micronutrient supplementation programmes, nutrition education, and comprehensive health and nutrition programmes. To reduce the incidences of early childhood morbidities especially diarrhea, effective parenting programmes included hand washing and breastfeeding promotion programmes. Home visitation by trained paraprofessionals was the predominant format among programmes that improve growth or health outcomes (non-oral health).

Moreover, findings showed that group settings must be combined with other modalities to be most effective. Dosage should also be relatively intensive, lasting at least one year on a monthly basis. These findings suggest that by having parents exposed to multiple modalities for a long period of time, the message of appropriate and adequate nutrition gets reinforced. By contrast, programmes that aimed to improve oral health could be didactic and significantly less intensive although preferably delivered by trained professionals. In

terms of developmental timing, the average age at time of intervention was primarily during the first year of life to the toddler years (12-36 months).

As expected, a majority of the interventions targeted the most vulnerable populations. Programmes like conditional cash transfers target the most vulnerable and are therefore potentially effective mechanisms to deliver parenting education to these populations. Further research is needed to address the feasibility of integrating explicit ECD parenting education into conditional cash transfer programmes and assess their impacts on improving or mediating the effects of cash transfers on outcomes. The impacts of this approach on other outcome domains are reported in other sections of this review.

3.2.1.2 Child Cognitive Development (n=6)

Six studies emerged that showed significant impacts on cognitive development. The sample sizes ranged between 103 and 13,889 children (median=139) in five countries: two from Jamaica and one each from Belarus, Brazil, South Africa, and Turkey. The settings in which the programmes took place were home-based, primary health care settings, and home- and community-based settings, which included home visits or a combination of home visits and group sessions.

Psychosocial Stimulation Except for one study, the primary programmatic approach was psychosocial stimulation (See Table 4 in Appendix 1). In this approach, primary caregivers are taught the importance of a range of behaviors and skills necessary to support children's non-health-related developmental outcomes. These include learning the importance of, and using skills that, promote positive parent-child interactions with children, providing positive attention and responsiveness to developmental milestones and cues, encouraging children's autonomy and exploration of their environment, and promoting attachment (Engle and Lhotska, 1999). In low resource settings, such as those included in this review, psychosocial stimulation activities were integrated into a family's daily routine and capitalized on the use of recyclable materials to create toys for young children.

Two examples of psychosocial stimulation programmes that combined home visits with group sessions were conducted in Turkey (Bekman, Koç *et al.* 2004) and in Brazil (Eickmann, Lima *et al.* 2003), the only non-RCT studies under the cognitive development category.

The Turkish study combined a summer preschool programme with a parenting education programme for mothers. The topics covered were broad, addressing the holistic needs of young children. The parenting education programme lasted 12 weeks. Mothers met once a week for 2.5 hours and were expected to engage in practices such as story-telling and creative activities with their children, as well as reinforce lessons children learned in their preschool. The preschool teachers also conducted home visits to provide feedback.

In Brazil, one community-based intervention with a home visitation component consisted of an initial home visit, three 3-hour workshops that also provided refreshments and transportation, and 10 reinforcement home visits (total of 14 contacts when children were between ages 13 and 17 months). Results of the Turkish and Brazilian studies showed impacts on school readiness and language skills (Bekman, Koç *et al.* 2004) and mental and psychomotor skills (Eickmann, Lima *et al.* 2003).

Other programmes combined psychosocial stimulation with nutrition supplementation. Two follow-up RCTs in Jamaica tested the efficacy of nutritional supplementation and psychosocial stimulation (separately or combined) in impacting cognitive outcomes in malnourished populations (Gardner, Powell *et al.* 2005; Walker, Chang *et al.* 2005). Both studies showed that supplementation was effective in improving children's cognitive outcomes only when it was combined with psychosocial stimulation; that is, nutritional supplementation alone was ineffective in improving cognitive development.

The training and credentials of the programme providers were mostly trained paraprofessionals, although two studies employed professionals (e.g., Brazil and South Africa). In the Brazilian psychosocial stimulation study, occupational therapists with specializations in child development delivered the workshops whereas trained paraprofessionals performed the home visits (Eickmann, Lima *et al.* 2003). In South Africa,

the programme employed a trained physiotherapist to deliver the programme to low-income families with young children, ages below 2.5 years, infected with HIV (Potterton, Stewart *et al.* 2010). In that study, over a 12-month period, the home stimulation curriculum was updated every three months to match with the child's developmental level. Although the study revealed greater change in programme children's mental development (measured using Bayley Scales of Infant Development—2nd edition) than control children, the programme children's mental development was still significantly delayed compared to the normal population. Moreover, the programme had no impact on children's anthropometry.

Apart from psychosocial stimulation as a programmatic approach in improving cognitive outcomes, one study examined the long-term impact of a breastfeeding promotion programme on cognitive development. This study was known as the Promotion of Breastfeeding Intervention Trial (PROBIT) intervention in Belarus, which is the largest lactation-related RCT in the world to date (Kramer, Aboud *et al.* 2008). Pediatricians from each of the PROBIT hospitals and polyclinics received an 18-hour lactation management training course. Midwives, nurses, and physicians provided breastfeeding support to programme mothers during labor, delivery, the postpartum hospital stay, and during visits to the polyclinics. A total of 17,046 women with healthy infants were enrolled and 13,889 were followed up when children were 6.5 years of age. Results showed that PROBIT children scored higher than control children in both standardized tests of intelligence and teacher ratings of reading and writing performance.

Summary Psychosocial stimulation programmes, which entail active engagement between the caregiver and the child, were effective in improving children's cognitive development. These programmes involved live demonstrations with children through play activities that are tailored according to the child's developmental level and the family's individual needs. Trained paraprofessionals were effective programme implementers. Although psychosocial stimulation programmes were effective in improving cognitive outcomes when targeting impoverished groups, malnourished children still performed well below their non-impoverished counterparts. The average age of intervention was around the toddler years.

In terms of dose, psychosocial programmes are delivered ideally as intensive home visiting programmes or as a combination of group and individual sessions. Programmes delivered as part of home visits ran between one and two years at weekly or monthly intervals. Programmes that were of shorter duration combined early education with the parenting programme, as in the summer preschool programme intervention in Turkey (Bekman, Koç *et al.* 2004). Of note, none of the studies reviewed offered group sessions solely. Based on one community-based programme in Brazil, when offering group sessions (in addition to home visits), it is recommended that transportation and refreshments are provided. Providing convenient services—such as child care services while parents are in attendance, or transportation services for rural families—as well as offering programmes at convenient locations (e.g., office, preschool, community centers) and times (including evenings and weekends when there is a demand) are known to increase participation rates (Moran, Ghate *et al.* 2004).

There is also strong evidence for combining psychosocial stimulation programmes with early education programmes as demonstrated in the Turkish study (Bekman, Koç *et al.* 2004). This is validated in research emerging from non-LMIC suggesting that multi-component programmes—those involving training of children, teachers, and parents—are effective in promoting school readiness skills (Moran, Ghate *et al.* 2004, Reese, Sparks *et al.* 2010). School readiness, which generally refers to a young child’s capacity to be ready for both learning and performing in the classroom, includes five dimensions: (i) physical well-being and motor development, (ii) social and emotional development, (iii) approaches to learning (e.g., enthusiasm, curiosity, task persistence), (iv) language development, and (v) cognition and general knowledge (Kagan, Moore *et al.* 1995). These skills are important precursors to lifelong success.

There is preliminary evidence that nutritional supplementation alone may be insufficient in improving cognitive outcomes in young children as demonstrated by the long term follow up of the Jamaica studies. However, breastfeeding promotion could be an effective strategy in improving cognitive outcomes. Given that breastfeeding promotion has a long-term impact on children’s full scale IQ and language development, this suggests that

breastfeeding promotion is the earliest explicit form of ECD parenting intervention that is effective in impacting children's cognition, not just their physical well-being.

3.2.1.3 Child Social and Emotional Development (n=2)

Young children's social and emotional competence, in addition to traditional intellectual capacities, has been shown to be essential not only for success in academics but also for success in adult life (Brackett, Rivers *et al.* 2011, Durlak, Weissberg *et al.* 2011). Promoting young children's healthy social and emotional well-being is therefore essential in setting the stage for optimal development.

Two evaluations, The Roving Caregivers Programme in St. Lucia (Janssens, Rosemberg *et al.* 2009), and the 17-year follow up of the Jamaican psychosocial stimulation + supplementation study mentioned previously (Walker, Chang *et al.* 2006) make up this section of the review. Both programmes were intensive. The Roving Caregivers Programme, which was both a home visiting and group-based programme targeted vulnerable families with children ages 0-3 and consisted of twice weekly visitations lasting 45 minutes per session in addition to monthly parenting meetings. The Jamaican study consisted of weekly 1-hour home visits for two years. Participation in both programmes resulted in greater interpersonal skills and self-esteem and lesser anxiety and depression. Although no impacts were found for externalizing behaviors (antisocial behavior, hyperactivity, and oppositional behaviors), participation in programme during the early years resulted in lower likelihood of being suspended or expelled from school.

Although only two studies found significant impact of ECD parenting programmes on children's social and emotional development (See Table 4 in Appendix 1.), this does not mean that these were the only two studies that examined this outcome domain. In the next section, we examine holistic outcomes, which pertain to studies that found ECD programme impacts across multiple developmental domains, including social and emotional development.

3.2.1.4 Holistic Outcomes (n=6)

Six studies, implemented in five countries (two each in Jamaica and Mexico, and one each in the Philippines and Vietnam), consisted of significant outcomes in more than one child developmental outcome domain, such as health, social and emotional (See Table 4 in Appendix 1). The number of children evaluated ranged between 140 and 7,922 (median=1,019). All but one of the six studies employed random assignment (four RCTs and two random assignment with no control group). Intervention approaches involved psychosocial stimulation, integrated health, nutrition, and development interventions, and social protection programmes.

Psychosocial Stimulation One such psychosocial stimulation programme in Jamaica (two studies) was derived from WHO's Programme for the Enrichment of Interactions between Mothers and Children, which targeted low birth weight children between 9-24 months of age (Gardner, Walker *et al.* 2003, Walker, Chang *et al.* 2010). Trained female paraprofessionals conducted eight weekly home visits (1 hour/visit) to play and talk with children and teach mothers how to engage their children through talking, singing, and showing affection. During the second phase, from 7-24 months, the trained paraprofessionals conducted 30-minute weekly home visits. At the end of the 8-week period, intervention infants exhibited more means-end problem-solving behaviors (as measured by a Piagetian problem-solving task where infants uncovered a hidden toy or retrieved a distant toy) and were rated higher in cooperation and happiness by trained observers compared to control infants (Gardner, Walker *et al.* 2003). In the six-year follow-up of that study, intervention children scored higher in mental acuity (performance subscale of the WPPSI and Corsi block design) and lower in total behavioral difficulties than control children; however, no long-term impacts were found for the full and verbal scales of the WPPSI, the PPVT, attentional capacity, and reading achievement (Walker, Chang *et al.* 2010). These findings demonstrate that intensive psychosocial stimulation programmes have long-term impacts on children's cognitive and social and emotional outcomes.

Integrated Health, Nutrition, and Child Development programmes have likewise been successful in impacting children's holistic development. In line with the notion of the *whole child approach*, integrated programmes are usually multi-sectoral programmes that aim to deliver a broader set of ECD-related services to families with young children.

Two studies were conducted in Southeast Asia and targeted the most disadvantaged communities. The large-scale Philippine ECD programme delivered a combination of center-based (e.g., day care centers, preschools, health centers) and home-based (family day care programmes and home visits by health workers) services (Armezin, Behrman *et al.* 2006). To link the center- and home-based services, child development workers (CDWs) complemented the roles of midwives and health workers in providing food and nutritional supplements and monitoring children's health status. CDWs also provided community-based parenting education about ECD. Programme children performed better than non-programme children in cognitive skills, gross and fine motor skills, expressive and receptive language, and social and emotional skills. Among two- and three-year-olds exposed to the programme, Z-scores were one-half to 1.8 of a standard deviation higher for motor and language development (Armezin, Behrman *et al.* 2006). Moreover, there were lower proportions of anemia and lower rates of wasting in programme areas than in non-programme areas. Positive programme impacts varied by age, but were more pronounced for children younger than age four.

In rural Vietnam where there was a high prevalence of stunting, Save the Children Japan implemented a multi-sectoral intervention for two years (Watanabe, Flores *et al.* 2005). The intervention had two components. The nutrition component included bi-monthly growth monitoring for all children and nine sessions of a 12-day nutrition education rehabilitation programme conducted every month targeting severely malnourished children. The ECD component provided material support and teacher training on child-centered pedagogy. This also included establishing small local libraries for parents and promoted play areas in homes. Furthermore, what is unique about this intervention is that it targeted fathers explicitly in addition to targeting mothers. The ECD component provided support for parents through a one-day training session for fathers and mothers separately every month

on various topics on child care and development. Results revealed that both programmatic components resulted in decreases in stunting, but results favored the ECD component + nutrition component group in decreasing severe stunting over the nutrition component only group. Moreover, compared to the nutrition-only group, the ECD component + nutrition component group performed higher in standardized test scores where more pronounced differences were found for stunted children. These findings suggest that an integrated approach to child development yields effects on the whole child and that high-risk children benefit the most, promoting equity. Moreover, dosage findings suggest that nutrition programmes are insufficient in impacting more holistic outcomes.

Social Protection the Mexican *Oportunidades* mentioned previously has been the model conditional cash transfer programme in Latin America. In the next set of evaluations that were five- (Fernald, Gertler *et al.* 2008) and 10-year (Fernald, Gertler *et al.* 2009) follow-up studies of *Oportunidades*, dose-response analyses comparing early (families enrolled immediately into programme) and late (families enrolled 18 months later) enrollment favored early enrollment across physical, cognitive, and social and emotional developmental outcomes (Fernald, Gertler *et al.* 2008; Fernald, Gertler *et al.* 2009). In the 10-year follow-up, however, greater programme dose did not sustain its advantage in height-for-age z scores, body mass index, and cognitive and verbal assessments (Fernald, Gertler *et al.* 2009).

Summary Holistic programming begets holistic outcomes. Ideally interventions should take on a whole child approach. The research summarized in this section suggests that effective approaches to improving holistic health and developmental outcomes in children could be in the form of multi-sectoral health and child developmental programmes (as in the examples of scale-up or large-scale programmes in Mexico, the Philippines, and Vietnam) or intensive psychosocial stimulation programmes. The former approach is efficient and effective in improving a host of child outcomes. The latter entails frequent interactions with caregivers and their children, lasting between one and two years. Across studies, it appears that dose is important. For example, in the Mexican *Oportunidades* cash transfer programme, participating in the programme for an additional 18 months was advantageous in terms of improving child outcomes. Hiring well-trained paraprofessionals was a cost-

effective

solution to delivering messages to parents. Malnourished children and younger age groups benefited the most from these programmes. This suggests that caregivers may be utilizing the money they receive to enroll their children in better quality care through growth monitoring, well baby visits, and participation in parenting interventions, which were some of the conditions for enrollment in *Oportunidades*. Future evaluations should examine parental activities after programme enrollment.

As evidenced in the Vietnam study, including fathers in the trainings is a promising and underutilized strategy (Barker, Bartlett *et al.* 2004, United Nations Department of Economic and Social Affairs 2011). Indeed, findings from higher income countries demonstrated stronger effects on both child and parenting behaviors when fathers were involved in the programme (Lundahl, Tollefson *et al.* 2008). Conducting ECD parenting programmes that target fathers explicitly are suggested for future research.

3.2.2 PARENT OUTCOMES

This section summarizes 33 studies that showed significant impacts on results for parenting only in the areas of parenting attitudes, beliefs, and practices. The section is divided into the following broad categories: (1) caregiving pertaining to promoting children's physical health and nutritional status and (2) caregiving beyond physical care.

3.2.2.1 Physical Health-Related Caregiving (n=19)

Early childhood parenting programmes that evaluated caregiving knowledge, attitudes and practices to improve physical health appear to be widely implemented. Herein, we define physical health-related practices as those that have been shown to reduce disease prevalence and promote growth and physical wellbeing among young children. A total of 20 studies addressed four overarching strategies to promote physical wellbeing by targeting parental outcomes in relation to (1) healthcare seeking behaviors and hygiene practices, (2) oral health, (3) nutrition education (alone or integrated with other health-related dimensions), and (4) care practices. Programme evaluations ranged from moderate

(n=129) to large (universal) coverage. Most evaluations (20%) were conducted in India. African (Belize, Nigeria, South Africa, Burkina, Malawi), Asian (China), South Asian (Nepal), South East Asian (Bangladesh, Thailand), and Latin American and the Caribbean (Haiti, Brazil) regions were also represented in the programme evaluations reviewed.

The overview of programmes indicated that paraprofessionals and a combination of service delivery modalities are commonly used when promoting physical child health and caregiving. The majority (65%) of interventions were delivered by paraprofessionals such as local community members and community health workers. Professionals delivered 20% of the interventions and 10% of the reports did not specify the service providers who delivered the intervention. Most service delivery modalities combined more than one approach (e.g., use of print materials, modeling, discussion, active instruction or teaching, media and community events) with the exception of two programmes that only utilized a lecture strategy. Delivery settings also varied, with community based (35%) and home and community (30%) being the most common forms of programme delivery. Most trials (40%) used random assignment, followed by non-random assignment (35%). Quality of the programme evaluations, as revealed by our quality scoring, varied considerably (cumulative scores ranged from 29.4 to 82.35). The sections below summarize the findings of the programme evaluations to assess what programme characteristics are associated with positive parental outcomes with a special emphasis on commonly reported approaches to cultural responsiveness in the programmatic design.

Healthcare seeking behaviors and hygiene practices Studies investigated the effects of ECD parenting programmes on health care seeking behaviors and hygiene practices associated with malaria, disease and acute respiratory infection management (Cropley *et al.*, 2004; Okeke, 2009; Holloway, *et al.*, 2009; Mohan *et al.* 2004; Curtis, *et al.*, 2001; and Luby, *et al.*, 2010). The key characteristics of these trials are displayed in Table 4 in Appendix 1.

Belize and Cropley et al (2004) examined the effect of health education interventions delivered by paraprofessionals on mothers' treatment-seeking behaviors for their children's malaria fevers. Interpersonal channels (e.g. voluntary collaborators and vector control team personnel) contextualized and disseminated the messages along with visual materials of classic malaria symptoms and recommended actions (e.g. displayed pamphlets and posters). Post-intervention surveys revealed that interpersonal communication improved some proxies of healthcare seeking behaviors in the intervention but not in the control groups (e.g. seeking malaria treatment within 48 hours of the first recognition of fever). Knowledge of malaria causes, symptoms and treatment also improved in response to the intervention. The study was unable to provide evidence that the visual materials positively influenced treatment-seeking behaviors. Education and communication materials, which included posters depicting a child with mild and severe malaria with a list of the clinical symptoms, were used in Nigeria to improve knowledge of causes, and care for moderate and severe malaria (Okeke 2009). The intervention was a combination of mass media, community-based activities, and training activities by leaders of women groups. 18 months after the intervention, there was a significant increase in the knowledge of symptoms of mild and severe malaria and targeted health care seeking practices.

Nepal and Hollaway et al (2009) evaluated the impact of a multi-modal intervention in the treatment of acute respiratory infection. Messages targeted knowledge on symptoms indicative of illness and corresponding treatment procedures. Professionals and paraprofessionals delivered small and large group activities and one-to-one counseling sessions. Results varied according to severity of Acute Respiratory Infection (ARI) and outcome of interest. For instance, attendance at health posts increased for severe ARI and fell in children with mild ARI. Although the study provides implementation strategies that utilize local service delivery infrastructure in difficult circumstances, further research is needed to assess the impact of dissemination strategies that only use visual materials and address symptoms of differing severities like ARI.

A parenting education programme was conducted in rural India to assess if training doctors in counseling, communication and clinical skills using the (IMCI) approach improved care

seeking behaviors in families of sick children (Mohan et al., 2004). The objective of the counseling sessions was primarily to teach mothers of children under-5 years of age to seek prompt care upon presentation of danger signs. Compared with control sites, mothers' acknowledgement of the need to seek timely and appropriate care increased, but there was no significant difference in care seeking behaviors. The authors' hypothesized changes in behavior may require prolonged exposure to the educational messages.

Hygiene practices were targeted to reduce the risk of diarrheal diseases and food-borne illnesses. In Burkina Faso (Curtis et al., 2001) and Bangladesh (Luby et al., 2010), programmes targeting behaviors associated with hygiene and hand washing practices were evaluated. Both programmes utilized a community-based approach. In Burkina, a combination of monthly house-to-house visits, weekly play, discussion groups in community health centers, and radio spots targeted stool management practices. In Bangladesh, field workers introduced soap or sanitizer and were instructed to wash hands after several exposures. Instruction was complemented with positive reinforcement by encouraging parents in the compound to support each other to improve hand hygiene, and by placing posted recognition stickers in households that used most soap/sanitizer. The Bangladesh intervention took into account local customs (e.g. sanitizer used did not contain alcohol because many Muslims in Bangladesh are reluctant to use products that contain alcohol). After 3-years of implementing the programme in Burkina Faso, the evaluation revealed greatest improvements in 2 out of the 4 target behaviors (hand-washing with soap after cleaning a child's bottom and the proportion of mothers who washed their hands with soap after using the latrine). In Bangladesh, the evaluation showed that waterless hand sanitizer was readily adopted by the community and reduced hand contamination. However, it did not improve the frequency of hand washing compared with soap.

Oral Health Two programme evaluations in India (Nair et al., 2009) and Thailand (Vachirarojpisan, Shinada, & Kawaguchi, 2005) assessed the effect of education interventions in parental oral health knowledge or practices. In Thailand, a study tested the effects of active involvement using a participatory dental health education (participatory-DHE programme) compared to a national teaching DHE programme. In the participatory

DHE group, a trained moderator delivered small-group sessions once a month during a 3-month

participatory dental health programme. The national DHE programme consisted of didactic teaching about early childhood caries (ECC) prevention methods and providing free toothbrushes. The participatory component of the DHE programme was associated with improved oral health practices such as parents brushing children's teeth and using the right amount of fluoride toothpaste. However, there were no differences in the incidence of cavities between participatory and non-participatory DHE programme groups. In India, public health nurses and community health workers facilitated oral health classes with mothers during group meetings. Audiovisual aids, modules, charts, posters and brochures in the regional language were utilized. Results revealed a statistically significant improvement in knowledge regarding oral hygiene habits, importance of milk teeth, causes of dental diseases, prevention of dental diseases, and treatment of some dental conditions.

Nutrition education Nutrition education interventions encompass a wide variety of approaches, including counseling about child feeding alone or in combination with food supplementation, fortification of complementary foods, and food preparation techniques to maximize nutrient quality. In South Africa (Faber, Venter & Benade, 2002) and Burkina Faso (Nana et al., 2006), nutrition education interventions were evaluated to test their impact on vitamin A intake and serum retinol concentration in children. Both interventions used contextualized approaches and tested the impact of locally available foods or utilizing home gardens with produce with high vitamin-A content. In South Africa, demonstration gardens were combined with a community-based growth-monitoring programme. One year after the intervention (which included 12 training sessions in the demonstration garden given during monthly growth monitoring sessions), vitamin A intake was higher among both intervention and control groups. However, the increase was greater in children from the intervention group. The authors hypothesized that control group effects could be explained by an increased awareness in the community that resulted from the visibility of project gardens and demonstrations as well as the nutrition education programme. In Burkina Faso, the programme evaluation assessed the effectiveness of a behavior change approach through promotional activities, with or without financial support, in improving vitamin A intake and serum retinol concentration through consumption of locally-available foods (mango and liver). Overall, the results indicated that both vitamin A intake and serum

retinol concentration improved significantly between the beginning and the end of the intervention regardless of the presence of financial support. In the absence of a true control group, it was difficult to fully attribute this improvement to the intervention.

Nutrition education programmes delivered, at least in part, by health service providers and that targeted parental health knowledge and health-seeking practices were also evaluated. Three studies assessed the impact of integrating nutrition and childcare education in center, hospital, and community health centers. The outcomes assessed were parental knowledge and practices and, in some cases, child health indicators and anthropometry. In Bangladesh, levels of childhood malnutrition were compared between areas where the Integrated Nutrition Project had been operational for over 5 years in community nutrition centres with matched non-project areas (Hossain, Duffield & Taylor, 2005). During monthly growth monitoring and promotion visits, caregivers of children 0-23 months of age, received counseling on health, family planning, breastfeeding, caring practices, personal hygiene and the use of iodized salt. Self-reported nutritional knowledge among mothers in the intervention group was significantly higher as compared to the control group, although no significant impact was observed in reducing moderate and severe underweight of children. However, the evaluation did not control for malnutrition rates at the beginning of the trial. In Brazil, physicians were trained with an IMCI-derived nutrition counseling protocol and retention of messages was examined (Pelto, et al., 2004). The intervention used locally appropriate messages, tools for assessing individual problems, and counseling skills of service providers. Mothers who received advice from trained providers had significantly higher rates of recalling the messages on specific foods and feeding practices as well as recommendations on food preparation compared to those who did not receive advice. The proportion of the messages recalled on breast-feeding did not differ significantly between the intervention and control groups. Furthermore, results from a study in Madagascar suggested that implementing the Essential Nutrition Actions (ENA) operational framework and Behavior Change Communication may lead to significant improvements in some child feeding and nutritional practices (breastfeeding initiation and continuation rates, feeding rates among children 6-23 months, rate of maternal iron-folic acid and vitamin A supplementation during the perinatal period) (Guyon et al., 2009). The providers and

community health workers used counseling cards, newsprint, and child health booklets. Recommendations and nutrition messages were harmonized with various health programmes (e.g. IMCI) and complemented with mass media and other community-based activities. No improvements were reported in increasing food intake during child illness or pregnancy.

Programme evaluations were also conducted to assess the effectiveness of promoting breastfeeding and feeding practices through available health-delivery channels. In India, a trial evaluated the effects of delivering exclusive breastfeeding and complementary feeding practices by trained health and nutrition workers (Bhandari et al., 2005). Counseling opportunities included visits to physicians, home visits, and immunization and weighing sessions. An increase in the number of channels through which caregivers were counseled was positively associated with exclusive breastfeeding prevalence and consumption of certain complementary foods among different child age ranges. Additionally, intervention areas, compared with the control group, had higher coverage for vitamin A and iron folic acid supplementation. A participatory nutrition education programme in Malawi was implemented to introduce a variety of practices for improving complementary feeding Hotz & Gibson (2005). Workshops, demonstrations, and written materials were developed and community Health Committee members and local Ministry of Health Surveillance Assistants delivered the locally adapted lessons for complementary feeding practices. The study indicated that through nutrition education, participating mothers were able to use existing food resources to improve complementary feeding practices and this was associated with enhanced adequacy of energy and intake of several micronutrients in the complementary diets of their children.

In China, township hospital doctors were trained on child nutrition, breastfeeding, complementary feeding, and counseling skills (Zhang, Shi, Chen, Wang & Wang, 2009). Participants in the intervention group had significantly higher scores than participants in the control group in knowledge, attitudes, self-efficacy, intention, norm beliefs, as well as feeding behaviors. The study found the intervention, mothers' knowledge, intention and subjective norm of villagers independently predicted maternal feeding behaviors after the intervention. The authors concluded that to motivate caretakers to adopt optimal feeding

behaviors, it was critical to provide them with necessary knowledge, information, skills, and a supportive environment.

Care practices: Estimates suggest that up to 1/3 of neonatal mortality could be prevented through high access of preventative family and community newborn care (Darmstadt et al., 2005).

Interventions targeting care-seeking behaviors impact not only survival but also physical outcomes and decrease in morbidities that can affect child health and development. In India, a combination of monthly community meetings from the 2nd to 3rd trimester, antenatal home visits, and neonatal visits were implemented to prevent hypothermia and modify practices and reducing neonatal morbidities and mortalities (Kumar et al., 2008). Two interventions (a package of essential newborn care with or without an indicator device for hypothermia) were tested against a control group who received routine services. The intervention was associated with improvements in prenatal (e.g. birth preparedness) and post-natal (e.g. thermal, umbilical, and skin care, and hygienic delivery and breastfeeding) care practices. Care-seeking behavior did not differ between the intervention and control groups. The programme was associated with a significant reduction in child mortality. Sociocultural contextualization and a community-based design targeted towards high-risk newborn-care practices, were some of the characteristics to which impacts of the intervention were attributed.

A community-based programme targeted fathers through father's clubs in Haiti (Sloand, Astone & Gebrian, 2010). The Father's Club in Haiti consisted of regular meetings among fathers to discuss their involvement in childcare. They also attended health education sessions with input from the nurse or village health agent where several practices (e.g. exclusive breastfeeding for 6 months, immunizing children, and providing adequate fluids and seeking appropriate health care when the child is sick) were discussed. Fathers' knowledge, skills, and performance in early childhood care were targeted. The presence of a fathers' club was associated with increased vaccination status, growth monitoring, and

vitamin A supplementation. However, child mortality rates and child weight did not differ before and after the initiation of father's clubs in the villages.

Summary: Data from two studies suggest interpersonal communication of contextualized and targeted messages may positively impact parental knowledge and specific healthcare seeking behaviors. One of the characteristics of the interventions, likely to be associated with positive impacts, was specificity of the health-related messages. Interventions that used the local workforce to deliver key messages, suggested that paraprofessionals can impact health knowledge among parents of young children alone or in combination with professionals. Further research is needed to assess the impact of visual materials alone in healthcare seeking knowledge and behaviors. Our review of two parenting programmes targeting hygiene practices suggests that programmes can be more effective in promoting healthy behaviors if they are built on local research and use contextualized dissemination channels. In Bangladesh, (Luby et.al. 2010), the large-scale 3-year programme suggested that the intervention should be delivered repeatedly and for an extended time to lead to measurable impacts at a population level. Furthermore, the Bangladesh programme suggests that use of new items (like waterless hand sanitizers) to improve hand washing practices may be more effective in settings where water and soap are unavailable. Therefore, to maximize the impact of the intervention, designing effective programmatic strategies should take into account existing practices and preferences.

The oral health programme evaluations indicated that oral health knowledge can be strengthened through education classes led by professionals and/or trained paraprofessionals. Improvement in oral health knowledge can be attained through a range of intervention doses, as illustrated by the range in the intensity of the programmes. Although a participatory approach to oral health education led to improved oral health practices, it did not contribute to a reduction in child caries. Further research is needed to assess the impact of knowledge change on sustained oral health practices and on outcomes for young children, and the added value of active involvement in improving child oral health during early childhood.

With the nutritional education programmes, vitamin A and retinol intake were assessed to test the impact of programmes targeted to contextualized food harvesting and preparation by caregivers of young children. Results were inconclusive in regards to the impact that gardening activities and financial support have beyond parental education alone. However, the two community-based activities evaluated showed modest effects on vitamin A intake suggesting that behavioral change can be instilled through contextualized approaches that involve locally-available foods. Results on interventions that combined nutritional and healthcare seeking education in health settings showed that self-reported nutritional knowledge, message recall of some feeding practices, and improvements in some nutritional practices can be improved via trained professionals. However, in Bangladesh although mothers in project areas reported better caring practices than mothers in the non- project areas, the improvements in self-reported practices were not associated with the nutritional status of children. Promotion of breastfeeding and complementary feeding practices through available health-delivery channels were successful in India, Malawi and China where existing health care channels were used to deliver messages and counseling. In China, mediators of programme effectiveness included participant intention and context.

The effect of parenting programmes on care practices via antenatal programmes and through a community-based approach were mixed. In India, although there was no difference in care- seeking behaviors between the control and experimental arms, the intervention was associated with a significant reduction in child mortality. The study results suggest that more frequent exposure to educational messages through a wider range of channels may lead to greater changes in mothers' care-seeking behaviors than we observed. However, prenatal and neonatal care practices were improved in response to the intervention suggesting that some practices can be modified using the implemented strategies. Conversely, in Haiti some targeted care and healthcare seeking practices were improved in response to Fathers' Clubs. Improvements on those practices did not translate to decreases in child mortality rate or changes in child weight. Further investigation is needed to assess how paternal education and improved practices translate into favorable child development and health outcomes.

3.2.2.2 Caregiving Beyond Physical Care (n=13)

The programme approaches employed in the 13 studies that demonstrated impacts on caregiving beyond physical care are categorized as follows: (1) child protection in terms of safety and injury prevention, (2) child protection in terms of physical abuse, (3) psychosocial stimulation and responsiveness, (4) responsive feeding³ and integrated health and development approaches. Programmes were implemented in 11 countries, almost half of which were in the Middle East: three in Turkey, and one each in Bangladesh, Brazil, Egypt, Mexico, Iran, South Africa, Pakistan, Jordan, Thailand, and Uganda. The number of parents evaluated ranged between 126 and 2,250 (median=337). The evaluations were comprised of seven RCTs, three quasi-experiments with comparison groups, and three with no control groups. Eight of the studies employed professionals (**Ertem, Atay et al. 2006; Farahat, Farahat et al. 2009; Issler, Marostica et al. 2009; Oveisi, Ardabili et al. 2010; Sawasdipanich, Srisuphan et al. 2010; Özyazicioğlu, Polat et al. 2011**) or a combination of professionals and paraprofessionals (**Mock, Arreola-Risa et al. 2003; Al Hassan and Lansford 2011**) to deliver the programme. The child's age at intervention was primarily during the toddler and preschool years.

Child Protection: Safety and Injury Prevention Among parents of infants and young children, safety is one of the most salient concerns. In LMIC, accidental injuries are the cause of death and disability among millions of children each year, with rates estimated to be at least five times higher than those in non-LMIC (Bartlett 2002). Four studies examined child protection in terms of physical safety and injury prevention that aimed to increase parental knowledge about pesticide hazards (**Farahat, Farahat et al. 2009**) and parental practices concerning safety (**Mock, Arreola-Risa et al. 2003; Issler, Marostica et al. 2009; Özyazicioğlu, Polat et al. 2011**). In all four studies, professionals or a combination of professionals and paraprofessionals delivered the programme. Moreover, all these programmes delivered services to the parents in groups. It appears therefore that group modality is a common approach to parenting programmes that are aimed at promoting child safety.

³ We acknowledge that responsive feeding is part of caregiving, but here, we focus on the psychosocial component.

Concerning protection against pesticide hazards, parents of preschool children in one farming community in Egypt received 15 health education sessions on pesticide hazards (**Farahat, Farahat et al. 2009**). Parents were assigned randomly to one of two conditions: either they listened to study investigators lecture or they viewed a videotape on hazards and safe use of pesticides. Although the video group scored higher than the lecture group on a test of pesticide knowledge, neither group differed on a test of pesticide practice, which suggests that the approach used was effective in improving knowledge but not practice.

Concerning parental practices around safety, three studies found significant impacts. All three programmes used didactic approaches or live demonstrations with individualized counseling. In Brazil, intervention mothers received individualized instruction provided by hospital staff and medical students in addition to being instructed using demonstrations with a baby doll model on how to position infants when asleep to reduce the incidence of Sudden Infant Death Syndrome (**Issler, Marostica et al. 2009**). In Turkey, study investigators conducted 60-minute group sessions on suitable first-aid and treatments for burns, lacerations, fractures, and poisoning in addition to handing out information on available community resources for mothers to contact (**Özyazıcıoğlu, Polat et al. 2011**). Both studies showed that providing demonstrations or examples of contrasting approaches to safety are effective in informing parental practices of safety.

In Mexico, one programme used a variety of approaches in addition to live demonstrations and individualized counseling (**Mock, Arreola-Risa et al. 2003**). The programme was based on both an established programme (The Injury Prevention Programme) and a locally developed one (*Pal Kai*, or "healthy child"). The study sites, which were contingent upon the safety needs of each socioeconomic stratum (SES) group, were private clinics that charged low fees, and publicly subsidized for upper-, middle-, and low-SES groups, respectively. In all clinics, the basic programme model consisted of elements of injury prevention counseling delivered by nurses and trained health care workers as part of overall health promotion. Counseling was upgraded as part of this intervention. For upper and middle SES groups, the upgrading

involved lectures and demonstrations lasting six hours and utilizing audio-visual materials from several sources. In addition, the middle SES group received clinic-based counseling that lasted 15-20 minutes, whereas the lower SES group received 30-minute home visits by trained nurses and health promoters. Results revealed that with respect to using caution, all three SES groups demonstrated improvements pre- and post-intervention. However for other dimensions (activities that required the use of safety-related devices), the results were mixed. The non-randomization of the design, the lack of details regarding selection criteria, and the lack of generalizability across SES groups limit the interpretation of results.

Child Protection: Physical Abuse Although the prevalence of child abuse varies across LMIC (Lansford and Deater-Deckard 2012), the percentage of children experiencing psychological abuse, moderate physical abuse, and severe physical abuse is higher in African countries (median rates=83%, 64%, and 43%, respectively) than in other regions (median rates=56%, 46%, and 9%, respectively) (Akmatov 2011). Our systematic search yielded four studies in four countries, three of which were Middle Eastern countries. None were conducted in African countries. All programmes were group-based except for one group-based programme with a home visiting component.

Three of the four programmes were group-based, all from the Middle East (Koçak 2004, Oveisi, Ardabili et al. 2010, Al Hassan and Lansford 2011). In Iran, Oveisi (2010) explored the viability of using primary health care settings as venues for preventive interventions for child physical and emotional abuse. In the first training session, trained doctors educated parents in parental skill building including discussions on common parenting mistakes. In the second session, mothers role-played and watched video clips. Both sessions lasted for two hours in two successive weeks. Results showed declines in parental reports of instances of abuse as well as in dysfunctional forms of parenting.

The other two group-based programmes targeted fathers (Koçak 2004) in addition to mothers (Al Hassan and Lansford 2011). The programmes were implemented in Turkey and Jordan. The Father Support Programme in Turkey targeted low-income immigrants who were fathers

(Koçak 2004). The programme was a 13-week group-based intervention (2.5 hours/week) that was limited to 15 fathers. The sessions were designed to promote socialization among fathers by sharing their problems and experiences with each other. By the end of the programme, father attitudes became less traditional and less authoritarian and they used more open forms of communication with their families. The other programme that targeted explicitly fathers (in addition to mothers) was the Better Parenting Programme in Jordan that was brought about by a national parenting study (Al Hassan and Lansford 2011). This programme has been brought to scale, with more than 200 centers nationwide implementing the programme. One distinguishing feature of the programme is its flexible approach to training. Sessions could be implemented once a week for one month or three to four consecutive days, or twice a week for two weeks. Although only 6% of fathers participated in the evaluation, results showed small but positive effects on knowledge of child neglect, spending time with child, and use of explanations in the course of discipline. No impact was found on knowledge of child abuse and expressions of contentment.

Finally, one programme combined group education with home visiting. This programme aimed to change parental cognitive processes regarding child rearing among Thai parents (**Sawasdipanich, Srisuphan et al. 2010**). The group education component used various programme components: group discussions, values sharing, scenario analysis of videotaped presentations, and homework using a booklet to evaluate the content of the group sessions and record their behaviors at home with respect to dealing with their children's behaviors. The home visits were used to identify parental challenges as well as to problem-solve and increase parental efficacy. Results showed programme impacts on parental attitudes toward child rearing but not on potential for child physical abuse.

Psychosocial Stimulation and Responsiveness Three studies found significant impacts on caregivers' ability to provide stimulation and emotional support (**Ertem, Atay et al. 2006; Cooper, Tomlinson et al. 2009; Rahman, Iqbal et al. 2009**). In Turkey, an adaptation of the IMCI Care for Development programme was implemented to enhance caregivers' play and communication with their toddlers (**Ertem, Atay et al. 2006**). During the clinic visit, trained pediatricians delivered the intervention, which consisted of

strategies for listening and observing positive interactions, using specific praise and positive reinforcement, and providing the caregiver with ideas on play and homemade toys for age-appropriate stimulation. This lasted approximately 30 minutes. Results of the evaluation showed impacts on availability of stimulation opportunities but not on caregiver responsiveness, suggesting that more intensive approaches (e.g., direct interaction with child) are needed to improve caregivers' ability to be emotionally responsive.

The next two studies aimed to improve maternal sensitivity and responsiveness, both adapted to fit local context. The Learning Through Play programme, which has been introduced in 10 countries including India, has been adapted in rural Pakistan (**Rahman, Iqbal et al. 2009**). The programme had a flexible format, allowing for both individual and group based formats. The individual-based format was delivered in parents' homes by local village health workers who knew the mothers well. The group-based format consisted of a one-week workshop that was integrated into routine pre- and postnatal visits, or spread over the first 3 years of the child's life. The programme required minimal amounts of literacy.

The other study was South Africa's adaptation of Britain's Social Baby programme, which aimed to improve maternal sensitivity and responsiveness toward their infants following WHO's principles of psychosocial stimulation (**Cooper, Tomlinson et al. 2009**). In that programme, trained female community workers visited homes considered high risk for parenting problems to provide parenting support and guidance. The intervention group was visited for a total of 16 sessions (ending at 5 months postpartum). Consistent with results found in more developed countries, the programmes found impacts on caregiving knowledge (**Rahman, Iqbal et al. 2009**) and on the quality of mother-infant relationships (Cooper, Tomlinson et al. 2009). Both studies, however, were unsuccessful in alleviating maternal depression. Both programmes employed trained paraprofessionals, suggesting that addressing maternal depression may require more highly trained professionals. Alternatively, treating maternal depression may require more targeted programmes aimed specifically at this issue. Recommendations to treat maternal depression given its sizeable impact not only on maternal mental health but also on child development include involving policymakers, researchers, and programme providers (**Knitzer, Theberge et al. 2008**).

Responsive Feeding and Integrated Health and Development Approaches

Two studies found significant impacts on parental caregiving related to both health- and non-health practices. One study in Bangladesh used a responsive feeding approach (**Aboud, Shafique et al. 2009**) and the other in Uganda was an integrated health and development programme (**Britto, Engle et al. 2007**).

In the responsive feeding approach, the caregiver feeds the child in response to the child's cues and psychomotor abilities to ensure that the child is fed when hungry and also satisfied with the feeding situation (**Engle and Lhotska 1999**). In the Bangladesh study, programme mothers received 12 sessions on child development and rearing in addition to six weekly sessions on responsive feeding (**Aboud, Shafique et al. 2009**). Although no programme impacts were found for weight gain, programme mothers became more responsive and more hygienic than control mothers. The authors of the study (**Aboud, Shafique et al. 2009**) concluded that for weight gain more nutritional input is required mainly in areas of high food insecurity.

In the Uganda study, child health days were held every six months combined with an educational campaign on health-seeking behaviors, breastfeeding and complementary feeding in the form of radio broadcasts, posters, and other local media (**Britto, Engle et al. 2007**). Moreover, family and community capacities were strengthened via job skills training and community grants and incentives. This programme happened for a period of two years. In addition to improvements in attitudes toward learning support for children, improvements with practices relating to physical care and school readiness skill building were found.

Summary Findings from evaluations of safety and prevention programmes suggest that professionals are effective deliverers of programme messages concerning child safety. Findings from non-LMIC support this by showing that authority figures—doctors, nurses, educators, for example—are successful at increasing parenting knowledge (Moran, Ghate et al. 2004). Common strategies to delivering messages include demonstrations using didactic approaches or using technology. Group settings may be effective in increasing

knowledge but not actual practice. It appears that even short-term programmes are effective, although operationalization of safety practices have mostly been based on self-reports. In fact, one study demonstrated that the programme had no impact on performance-based practice (Farahat, Farahat et al. 2009). In non-LMIC, ECD parenting programmes that aim to improve safety are most effective when they cater to families with children less than three years of age, and provide case management services and parent-child activities (Kendrick, Barlow et al. 2007).

Moreover, findings from evaluations of physical abuse prevention programmes suggest that group-based programmes are effective in preventing child abuse. Although impacts were found for parental knowledge, attitudes, and practices, only one study operationalized child abuse in terms of actual commitment of abuse. It is important to distinguish between *potential* for and *actual* abuse. Indeed, one systematic review of 298 publications conducted in primarily non-LMIC revealed four types of programmes considered to be promising approaches to prevent actual child abuse as opposed to potential to commit abuse (Mikton and Butchart 2009). These programmes are ideally: (i) early childhood home visitation programmes where trained personnel visit parents and their children in their homes to provide support, education, and information to prevent child maltreatment; (ii) center-based parent education programmes delivered in groups that aim to prevent child maltreatment by improving parents' childrearing skills, increasing ECD knowledge, and encouraging the use of appropriate behavior management strategies; (iii) programmes that include abusive head trauma (Shaken Baby Syndrome) prevention; and (iv) multi-sectoral programmes that include services such as family support, preschool education, and child care. Less successful types of programmes include: (i) child sex abuse prevention programmes in the form of universal programmes delivered in schools that teaches children about body ownership and how to detect abusive situations; (ii) media-based interventions in the form of media campaigns to raise public awareness; and (iii) support groups that aimed to strengthen parents' social networks. Moreover, that review noted that home visitation and parent education programmes were both effective not just in preventing actual abuse but also in reducing risk factors associated with it (Mikton and Butchart 2009). Given that rates of abuse are higher in African countries (Akmatov, 2011), none of the studies were conducted

in the African continent within the past decade, suggesting that not enough child protection programmes are being evaluated in high risk regions.

In summary, across studies that showed significant impacts on caregiving that promoted child development (non-health), the findings suggest that professionals were regarded as individuals with authority and expertise and were effective in increasing parental knowledge about child protection. Group-based programmes appeared to be effective in impacting knowledge about child protection, although its impact on actual as opposed to self-reported abuse remains inconclusive. Single dose programmes were insufficient in improving parental emotional responsiveness. Combining home visiting with group sessions appeared to be promising even if they were delivered by trained paraprofessionals. Responsive feeding and integrated programmes were also effective programmatic strategies for improving parental practices promoting child development and protection.

3.2.3 COMPREHENSIVE (BOTH CHILD AND PARENT) OUTCOMES

Parenting programmes generally aim to change parental knowledge, attitudes, and practices that would, in turn, improve child outcomes. Not all parenting programmes evaluate both parent and child outcomes and find impacts on both. In this section, studies that showed significant impacts on both parent and child outcomes (i.e., comprehensive outcomes) are presented. Here, comprehensive outcomes are organized according to (1) child physical health and health-related caregiving practices and (2) child developmental outcomes and associated parenting practices.

3.2.3.1 Child Physical Health and Health-Related Caregiving Practices (n=19)

Nineteen studies, half of which were RCTs, found significant impacts on child physical health and health-related caregiving practices. The studies evaluated between 121 and 6,144 child-caregiver pairs (median=744) across 9 countries: Bangladesh, Brazil, Egypt, Ethiopia, Haiti, India, Peru, Senegal, and Uganda. The programmatic approaches used were

in the form of breastfeeding promotion, hygiene and disease prevention, nutrition education, and comprehensive health and nutrition programmes.

Breastfeeding Promotion programmes in LMIC have been shown to effectively inform new mothers of breastfeeding's benefits and to increase the chances of actually breastfeeding (Imdad, Yakoob et al. 2011). Indeed, studies have shown that knowledge of breastfeeding benefits are associated with confidence in breastfeeding and actual lactation duration (**Chezem, Friesen et al. 2006**), which are important in ensuring neonatal health.

In our review, we found three studies of breastfeeding promotion programmes that found impacts on both child health and parenting practices. One was conducted in India (**Bhandari, Mazumder et al. 2004**) and two were conducted in Brazil (**Cardoso, Vicente et al. 2008, Vitolo, Bortolini et al. 2008**). In India, the 12- and 18-month follow-up of a breastfeeding promotion programme mentioned in previous sections (**Bhandari, Bahl et al. 2003; Bhandari, Mazumder et al. 2005**) showed small gains in height, with greater gains found in boys than in girls (**Bhandari, Mazumder et al. 2004**). This study also found programme effects on parental health practices (See Table 4 in Appendix 1). In Brazil, one programme was based on WHO guidelines that was delivered in the home setting (**Vitolo, Bortolini et al. 2008**) and the other was based on a systematic review of strategies appropriate to a primary healthcare setting that effectively increases the duration of breastfeeding (**Cardoso, Vicente et al. 2008**). Both programmes showed lower rates of respiratory morbidity (but only for <4 months of age in Cardoso et al. (2008)) and more appropriate health-related caregiving practices. In the Cardoso et al. (2008) study, reductions in diarrhea were found but only for the 4-12 months age group, not the younger group. This study is also to be interpreted cautiously, given its low quality score (23%).

Hygiene and Disease Prevention The next set of studies was a community-based hygiene and disease prevention programme conducted in Ethiopia (**Cumberland, Edwards et al. 2008; Edwards, Harding-Esch et al. 2008**). These programmes utilized available community resources to disseminate health information. In Ethiopia, the programme was known as the

International Trachoma Initiative (ITI), which was derived from the Surgery, Antibiotics, Facial Cleanliness and Environmental Improvement (SAFE) strategy and disseminated in randomly selected communities through mass drug administration, information, education and communication materials, and community video broadcasts (**Cumberland, Edwards et al. 2008; Edwards, Harding-Esch et al. 2008**). Post-intervention data indicated that ITI led to a reduction in odds of active trachoma among young children living in programme areas and increases in parental knowledge of eye disease prevention but not in reported or observed hygiene practices (**Cumberland, Edwards et al. 2008**). The three-year follow-up showed lower odds of infection in older children (6-9 years old) than in younger children, and in children who received two or three doses rather than one (**Edwards, Harding-Esch et al. 2008**). There is evidence of improvement in sanitary practices surrounding water usage and the presence of fly populations in the follow-up study.

Health and Nutrition Education Six studies evaluated health and nutrition education programmes. Except for one study (**Santos, Victora et al. 2001**), five evaluated programmes that targeted malnourished populations (**Ghoneim, Hassan et al. 2004; Kilaru, Griffiths et al. 2005; Penny, Creed-Kanashiro et al. 2005; Roy, Fuchs et al. 2005; Waters, Penny et al. 2006**). Except for Kilaru and others (2005), professionals and experts (**Santos, Victora et al. 2001; Ghoneim, Hassan et al. 2004**) or a combination of professionals and paraprofessionals (**Penny, Creed-Kanashiro et al. 2005; Roy, Fuchs et al. 2005; Waters, Penny et al. 2006**) delivered the health messages. For example, in Bangladesh, doctors received 20-hour training in nutrition counseling following the IMCI feeding guidelines (**Santos, Victora et al. 2001**). Maternal recall of dietary recommendations and use of recommended foods and feeding practices were higher in the programme group than in the control group, although gains in anthropometry (weight-for-age and weight-for-height) were found only for the oldest age group (between 12 and 18 months).

In food insecure regions, the programmes we reviewed utilized local resources to educate caregivers. In India, for example, locally trained counselors provided monthly nutrition education to caregivers with children between five and 11 months of age (**Kilaru, Griffiths et al. 2005**). The counseling messages focused on the preparation and the use of

developmentally appropriate local foods and the preparation of these foods as well as feeding advice. The counselors were trained to be sensitive of household constraints (e.g., limited financial resources, available household food, decision-making capacity and privilege within the family structure). The Indian programme resulted in greater weight velocity and greater dietary diversity.

Delivery settings also varied for health and nutrition programmes reviewed. In Peru, the extent to which local communities could serve as delivery settings for nutrition education programmes to be integrated with existing nutrition services was tested (**Penny, Creed-Kanashiro et al. 2005; Waters, Penny et al. 2006**). Local field workers visited families during crucial stages of development to assess nutrition, feeding practices, and growth: after birth and at 3, 4, 6, 8, 9, 12, 15, and 18 months of age. Reductions in stunting and increases in age-specific feeding knowledge and health-seeking behaviors were reported. Thus, the health centers improved their quality and coverage of their nutrition education through local field workers (**Penny, Creed-Kanashiro et al. 2005**).

In addition to community-based settings, the utilization of day care centers as delivery settings of nutrition education programmes was tested in Egypt (Ghoneim, Hassan et al. 2004). The programme consisted of establishing kitchens in the centers and providing two meals per day. In addition, parents received 12 health education sessions from university staff on feeding practices and feeding schedules. Improvements in maternal nutrition knowledge and in anthropometric measures and decreases in the percentage of anemic children were observed post-intervention. The Peruvian and Egyptian studies highlight the importance of integrating health and nutrition education programmes into existing structures.

In Bangladesh, the amount of parenting instruction needed to impact change was examined by Roy and colleagues (2005). Moderately malnourished mothers were randomly assigned to one of the following nutrition education conditions: (1) twice a week for three months, (2) twice a week for three months in addition to supplementary feeding for six days a week, and (3) twice a month nutrition education as part of standard routine service of the Bangladesh Integrated Nutrition Project (the control condition). No differences

between the two intervention groups were found in terms of child anthropometry, morbidity, and parental feeding practices, but both interventions were favored over the control condition. This study showed that additional supplementary feeding had no additive impact on early childhood health when combined with health education. This finding, however, should be interpreted with caution, as unintended impacts were reported (e.g., higher rates of diarrhea and febrile episodes in intervention groups than in control group).

Nutrition education programmes are more effective when professionals deliver the health messages. Parents may interpret health care professionals as experts in the field and are therefore more amenable to didactic instruction. Nutrition education programmes that are integrated into existing programmes or structures such as nutrition services (**Penny, Creed- Kanashiro et al. 2005; Waters, Penny et al. 2006**) or early childhood services (**Ghoneim, Hassan et al. 2004**) are more effective.

Comprehensive Health and Nutrition Programmes Eight studies were categorized under comprehensive health and nutrition programmes. The programming modalities were community-based programmes (**Alderman 2007, Dubowitz, Levinson et al. 2007; Roy, Jolly et al. 2007; Alderman, Ndiaye et al. 2009, Arifeen, Hoque et al. 2009**) and home visits (**Ruel, Menon et al. 2008; Donegan, Maluccio et al. 2010; Feldens, Giugliani et al. 2010**).

Five studies were community-based programmes that promoted health, growth, and nutrition. Two studies were conducted in Bangladesh. One tested the efficacy of the IMCI strategy in childhood mortality and nutrition (**Arifeen, Hoque et al. 2009**) and the other one was a comprehensive health and nutrition education programme that targeted mothers of moderately malnourished children aged 6-9 months (**Roy, Jolly et al. 2007**). In the IMCI study, all three components of the IMCI strategy (i.e., health-worker training, health-systems improvements, and family and community activities) were implemented. Village practitioners delivered information on management of sick children, avoidance of harmful treatment practices, and referral of severely ill children. The study also trained and

supported Muslim imams identified in the programme areas to convey crucial messages during sermons. Moreover, a theater script addressing IMCI messages was developed and two community theater groups were trained and supported to undertake open-air theater shows in the IMCI area villages once every eight to nine months to communicate key messages. Caregivers in programme areas were more likely than those in control areas to utilize available community resources (e.g., counseled by village health workers, attended meetings on maternal and child health). There was also evidence of lower prevalence of stunting and wasting in programme areas than in control areas.

In the other study in Bangladesh, the programme group received weekly nutrition education in addition to standard care for the first three months and then once every two weeks for the next three months whereas the control group received regular services from the Bangladesh Integrated Nutrition Project. Mothers in the programme group had better feeding practices than mothers in the control group. Moreover, children in the programme group had lower rates of stunting, were less underweight, and had greater weight gain than children in the control group. The nutrition programmes reviewed therefore were effective in improving both anthropometric measures and maternal caregiving practices.

The next set of community-based health and nutrition Programmes were implemented in Uganda, Senegal, and India. The Uganda and Senegal programmes, which capitalized on the support of parish activities and a national multisectoral coordinating body, respectively, were successful in impacting rates of being underweight and parental caregiving behaviors (Alderman 2007; **Alderman, Ndiaye et al. 2009**). The goal of the Dular programme in India was to capitalize and develop community resources at the grassroots level to improve nutritional practices and decrease malnutrition. Activities included the establishment of a community-based tracking system of the health status of women and children among other growth and nutrition activities. In the evaluation of the Dular programme, the intervention was divided into three: one receiving the regular Dular programme (regular health and nutrition activities, training and advocacy, distribution of education materials), one receiving the intensive Dular programme (regular programme with the addition of training and assignment of local resource persons, monitoring, and follow-up activity), and one non-

Dular group (receiving regular health and nutrition activities) (Dubowitz, Levinson et al. 2007). Either regular or intensive programmes were favored over the non-Dular in terms of parental health and nutrition practices and rates of being underweight. Rate of immunization was higher in the regular Dular group than both intensive Dular and non-Dular groups.

One intervention in Brazil combined oral health promotion with Ten Steps for Healthy Feeding, which was a partnership between WHO and the Brazilian National Health Policy (Feldens, Giugliani et al. 2010). The other intervention was conducted in Haiti (Ruel, Menon et al. 2008; Donegan, Maluccio et al. 2010). In the Brazilian study, 12 university-level nutrition students who were extensively trained delivered 30-minute monthly home visits up to six months and then bi-monthly home visits for the next six months. Although the programme did not impact consumption of fruits and vegetables, significant impacts favoring the intervention were found for fewer caries and caregivers giving lower density of sugar in foods (Feldens, Giugliani et al. 2010). The evaluation of the Haitian programme involved 13-14 home visits for newborn infants and severely undernourished children in addition to other programme activities (food assistance, nutrition counseling provided at rally posts and mothers' clubs, vaccination, vitamin A supplementation, oral rehydration salts, and drugs that attack parasites) (Ruel, Menon et al. 2008; Donegan, Maluccio et al. 2010). For the evaluation, two versions of the programme were implemented. The preventive programme targeted all children (6-23 months old) whereas the recuperative programme targeted underweight children (6-59 months old). Compared to the comparison group, caregivers from either programme versions were more likely to take their children to rally posts for health education, growth monitoring and getting full vaccinations for their children. Moreover, children assigned to the preventive (universal) programme had lower incidences of stunting, wasting, and being underweight than children in the comparison group; there was no difference between children assigned to the recuperative programme and those assigned to the comparison group. The effects on anthropometric measures were stronger for younger children (i.e., those exposed to the programme during the ages 6-23 months). They provide helpful guidance on the level of training of service providers and programme dose.

Summary This section reviewed studies that examined and showed impacts on both child and parenting outcomes related to physical well-being. A common strategy used in the programmes reviewed capitalized on available community resources and community events to deliver the programme. Places of worship served as programme delivery settings in some cases. Further, linking programmes to existing policies provides an illustration of how to test the efficacy of policy implementation. Multisectoral partnerships have been noted as the key ingredient to programmatic success. No additive effects were found for supplementary feeding or food fortification efforts. There is some evidence that preventive nutrition programmes (i.e., targeting entire populations) as opposed to recuperative (i.e., targeting malnourished populations) ones have greater impacts. In terms of developmental timing, impacts on anthropometry were stronger for children who were exposed to the programme when they were younger.

3.2.3.2 Child Developmental Outcomes (Non-Health) and Associated Parenting Practices (n=13)

Thirteen studies conducted in eight countries-- Bangladesh, China, India, Jamaica, Mexico, Nicaragua, Paraguay, and Turkey—evaluated between 100 and 4,465 child-caregiver pairs (median=202) and found significant impacts on both child and parent outcomes concerning non-health-related outcomes. Eight were RCTs. Over ¾ of the programmes mentioned were delivered by paraprofessionals. Successful programmatic approaches to impacting child developmental outcomes and associated parenting practices were in the form of psychosocial stimulation programmes, integrated health and development programmes, and social protection programmes.

Psychosocial Stimulation Studies that examined psychosocial stimulation programmes were conducted in India (Sharma and Nagar 2009), Turkey (**Kagitcibasi, Sunar et al. 2001**), Jamaica (**Walker, Chang et al. 2004**), and Mexico (Solis-Camara and Romero 2002). These studies have shown that psychosocial stimulation programmes, which require direct interactions with children, are successful not only in improving children’s information processing skills, language skills, and social and emotional well-being, but also in improving

caregiver practices that promote children's cognitive and social and emotional development. It appears that paraprofessionals are as effective parent trainers as professionals given that the programmes reviewed used either one or the other.

The longitudinal impact of one model psychosocial stimulation programme in Turkey has received international attention. The Turkish Early Enrichment Project (TEEP) was designed to train mothers to develop their children's cognitive abilities and improve parent-child interactions (**Kagitcibasi, Sunar et al. 2001; Kagitcibasi, Sunar et al. 2009**). Two hundred eighty mothers and their preschool-aged children, who belonged to three categories of early child care environments (i.e., educational nursery school, custodial day care, and home care) participated in the study. Children in the home care group were randomly assigned to receive the programme or not. The programme consisted of a cognitive component and a mother enrichment component. The cognitive component consisted of 60 bi-weekly guided group discussions over two years. Trained local female coordinators, with relatively high levels of education, delivered the sessions both in the home and in the group settings. Both role-playing and direct instruction were used to teach mothers how to interact with their children. Mothers worked with their children 15-20 minutes a day. The mother enrichment programme consisted of 30 bi-weekly guided group discussions that lasted for one hour. The topics for the discussions included nutrition, child development, parent-child interactions, and parental well-being. The discussions catered to mothers' everyday experiences. Results of the four-year, follow-up evaluation showed that mothers in the programme were more likely to be involved in cognitive stimulation activities than those who were not in the programme. In addition, the children in the mother programme scored higher in analytic ability, and the programme had sustained effects in school attainment, vocabulary scores, favorable attitudes toward school, and family and social adjustment at the seven-year, follow-up study (**Kagitcibasi, Sunar et al. 2001**). Findings highlight the importance of the home environment as a support mechanism to early childhood education.

The studies reviewed here suggest that intensive programmes are successful in impacting child and parent outcomes.

Responsive Feeding: The International Centre for Diarrheal Diseases Research in Bangladesh examined the impacts of a responsive stimulation and feeding intervention on child nutrition and developmental outcomes as well as caregiving practices (Aboud 2007; **Aboud, Moore et al. 2008**; Aboud and Akhter 2011). In the first study that used a post-test only design, trained local female peer educators imparted information to groups of mothers on a comprehensive set of topics (e.g., health and sanitation, cognitive and language development) over an average of 16 sessions for one year (Aboud 2007). In addition to improvements in children's weight-for-height z scores, improvements in both knowledge and actual practices that promote child development were found. However, no improvement in language comprehension was found. This finding suggests the need to include children in the session activities and focus on specific practices rather than information. A subsequent RCT that included children and focused on responsive interactions found language differences (Aboud and Akhter 2011). In that study, control mothers received 13 informational sessions on health and nutrition. In addition to what control mothers received, intervention mothers received 6 weekly 90-minute group sessions on feeding and stimulation delivered by local peer educators. The programme taught parents about hygiene (e.g., how to wash their child's hands before eating) and promoted health and nutrition strategies (e.g., dietary diversity, allowing for self-feeding). Verbal responsiveness was also stressed, as were coping with refusals. One additional intervention group received also 6 months of food powder fortified with minerals and vitamins. Results of the impact evaluation showed that the intervention group had more stimulating home environments and mother-child responsive talking than the control group. Moreover, intervention children had higher scores than control children on language development, mouthfuls eaten, and hand washing. Food fortification contributed only to weight gain but not language development. In summary, the responsive feeding approach, if implemented at least between 16 and 18 sessions, are effective in improving weight and maternal feeding practices (Aboud 2007, Aboud, Moore et al. 2008); language ability is more likely to be improved if the programme involves children directly (Aboud and Akhter 2011).

Integrated Health and Development Programmes The evaluations of integrated health and development programmes, were conducted in China (**Jin, Sun et al. 2007**),

Bangladesh (**Hamadani, Huda et al. 2006**), Jamaica (**Powell, Baker-Henningham et al. 2004**), and Paraguay (**Peairson, Austin et al. 2008**). All programmes were delivered by local community health workers who were mostly well-trained except for one programme that employed volunteers with minimal training and supervision (**Peairson, Austin et al. 2008**). Only one evaluation employed non-random assignment (**Peairson, Austin et al. 2008**).

The China study was based on WHO's Care for Development programme, which offered an integrated package consisting of psychosocial stimulation in addition to the IMCI health and nutrition package (**Jin, Sun et al. 2007**). Trained health professionals counseled caregivers for a total of two counseling sessions that contained age-specific messages on how caregivers could engage their children both in play and in everyday communication. The programme had no discernible impact on psychomotor development, but the programme impacted children's language and adaptive and social behaviors as well as mothers' knowledge of child rearing.

The Bangladesh and Jamaica studies included a home visiting component. Both studies integrated early stimulation into either an existing national nutrition programme (**Hamadani, Huda et al. 2006**) or into primary health care settings (**Powell, Baker-Henningham et al. 2004**). Both programmes targeted malnourished populations. Although both programmes were unsuccessful in improving children's psychomotor development, both were successful in improving not only children's cognitive and social and emotional outcomes, but also in improving mothers' knowledge and practice of child rearing. Both programmes also were intensive in terms of dosage. The Bangladesh programme consisted of weekly group meetings for 10 months followed by bi-weekly meetings for 2 months, and bi-weekly home visits for 8 months, followed by weekly home visits for 4 months. The Jamaican programme consisted of 30-minute weekly home visits for one year. Both programmes involved direct interaction with the child. The Bangladesh curriculum, which originated in Jamaica, was adapted to the culture by including traditional games and songs and by producing low-cost picture books suitable for Bangladeshi children and their mothers. The curriculum stressed the importance of parent-child interactions and provided developmentally appropriate

activities for the child. Parents were educated on the importance of praising and giving

positive feedback, engaging in conversation with children, and discouraging punishment, among others.

The other integrated programme was the Pastoral del Niño, in Paraguay, which has been an ongoing low-cost programme since 1995 that caters to children 0-5 years of age (**Peairson, Austin et al. 2008**). Minimally trained and supervised volunteers meet with families in chapels or community centers once a month to engage parents in a discussion about child health, nutrition, safety, and development. Volunteers also conduct home visits as well as accompany pregnant women to health posts for prenatal checkups. Although no programme effects were found for stunting and underweight, the programme had impacts on other child developmental outcomes and parental caregiving and child rearing practices (See Table 4 in Appendix 1). The low quality score rating of the study, however, warrants caution in the interpretation of findings.

Social Protection Two evaluations of Nicaraguan conditional cash transfer programmes have been shown to effectively impact holistic development and parenting outcomes. (Maluccio and Flores 2004, Macours, Schady et al. 2008). The *Red de Protección Social* was modeled after the Mexican *PROGRESA* programme, and the *Atención a Crisis* pilot programme was modeled after *Red de Protección*. For both programmes, during enrollment and pay days, programme staff repeatedly stressed the importance of varied diets, health, and education to caregivers. This form of communication was meant to instruct parents where to invest their money and what to consume (Macours, Schady et al. 2012). To remain eligible in the programme, caregivers were required to take their preschool-aged children for regular visits to health centers for growth monitoring, vaccination, and receipt of food supplements. The difference between *Red de Protección* and the *Atención a Crisis* pilot programme was the latter's reliance on public health infrastructure in contrast to *Red de Protección*'s reliance on private health providers.

The evaluation of both programmes were based on clustered RCTs. Results of the *Red de Protección* revealed that parents in programme areas were more likely than parents in non-

programme areas to take their children ages 0-3 to health control centers and feed their children with more varied diets (Maluccio and Flores, 2004). The effects were stronger among the poor and extreme poor but not for non-poor populations. Furthermore, the increased variety in household diet and increased use of preventive health care services for children were accompanied by an improvement in the nutritional status of beneficiary children under age 5. The net effect was a decline in the number of stunted children. Despite improvements in the distribution of iron supplements to these same children, however, *Red de Protección Social* was unable to improve hemoglobin levels or lower rates of anemia (Maluccio and Flores, 2004).

For the evaluation of *Atención a Crisis*, parents were assigned randomly into one of four conditions: (1) a conditional cash transfer contingent upon children's primary school and health service attendance (CCT only), (2) a conditional cash transfer plus a scholarship that allowed one of the household members to choose among a number of vocational training courses offered in the municipal headquarters (CCT + training), (3) a conditional cash transfer plus a productive investment grant aimed to encouraging beneficiaries to start a small non-agricultural activity (CCT + investment), or (4) control condition (**Macours, Schady et al. 2008**). Nine months after programme receipt, effects for the three programme packages were similar throughout. Impacts favoring any of the programme groups over the control group were noted for vocabulary, memory, psychomotor skills, and social-personal skills (**Macours, Schady et al. 2008**). These were domains where children had particularly large delays, and where socioeconomic gradients were steeper. Caregiver practices also changed, which may account for impacts found in children's development. Overall food expenditures increased among programme households, and expenditures on nutrient-rich food such as animal proteins, fruit and vegetables increased more than proportionally. Moreover, programme caregivers were more likely than control caregivers to take their children for growth check-ups to receive care and nutrition services. Furthermore, early stimulation activities such as reading to the child were greater in programme households than in control households. Although programme children had lower rates of stunting than control children, no effects were found for rates of underweight (under 5 months) and caregiver report of problem behaviors.

Summary Findings are consistent with results from previous sections. That is, intensive (at least weekly for one year) psychosocial stimulation programmes are effective in changing parental practices and child mental and social and emotional developmental outcomes but not effective in changing psychomotor developmental outcomes and anthropometric measures even when these programmes are integrated into existing nutrition programmes. Psychosocial stimulation programmes combined with formal early education yielded robust longitudinal effects as evidenced in the Turkish demonstrations. The findings also stress the importance of including children in the programme as evidenced in the responsive feeding programmes implemented in Bangladesh. These findings are consistent with those from non- LMIC, which revealed that strategies associated with improving both child and parent outcomes included: (i) training parents how to interact positively with their children on a daily basis (real-life everyday scenarios) and (ii) live modeling (practicing newly learned skills with their own child) vs. role-playing with a peer or trainer (Kaminski, Valle et al. 2008).

In addition to psychosocial stimulation programmes, social protection programmes in the form of conditional cash transfer programmes appear to be promising in spite of the inexplicit parental training involved. Indeed, findings from welfare demonstration programmes in the US yield similar results. Duncan and others (2011) pooled data from four studies that evaluated RCTs of eight welfare and antipoverty programmes (close to $N=20,000$). Like conditional cash transfer programmes, none of the programmes evaluated were designed to affect child outcomes directly nor were they designed to target parenting outcomes. Results revealed that the preschool period was especially vulnerable to income fluctuations. Specifically, a \$1,000 increase in annual income sustained for at least two years resulted in a 6% SD increase in achievement test scores. This finding in the US suggests that the small but significant effect size of the programmes may become larger if the welfare programmes targeted explicitly parenting and child outcomes.

The pathways by which increases in income lead to better parent and child outcomes can be explained by data drawn from the Panel Study of Income Dynamics (Yeung, Linver et al. 2002). Here, Yeung and others (2002) demonstrated that there are two pathways by which

income is linked to outcomes. The first pathway is through the impact of increased income on increased access to stimulating environments—for example, increased use of center-based services for early education and care—which, in turn, impacts children’s cognitive development. The second pathway is through the impact of increased income on maternal emotional well-being—for example, reductions in maternal stress—which, in turn, impacts children’s social and emotional well-being. Although the effects of income supplements are generally positive, one study found that this was only true for parents who were “hard-to-employ” but not for parents who were “hardest-to-employ” (Yoshikawa, Magnuson et al. 2003). Of note, although cash transfers appear to be effective to a certain extent, they are insufficient in reducing the detrimental impacts of poverty on young children; aligning such strategies with health, education, and other ECD services is an important step (**Aber, Biersteker et al. 2013**).

3.2.4 STUDIES WITH NO IMPACT OR PREDOMINANTLY MIXED FINDINGS

The 14 studies reviewed in this section showed either no impact or predominantly mixed findings on the outcomes of interest. Half of the studies reviewed were in the area of health and the other half were in the area of child development (non-health), including associated parenting outcomes.

3.2.4.1 Child Health and Parental Health-related Caregiving Outcomes (n=7)

Seven studies with the following programmatic approaches make up this section: (1) hygiene promotion in Niger (**Abdou, Munoz et al. 2010**), (2) nutrition education in China (**Strand, Peng et al. 2002**) and Senegal (**Gartner, Kameli et al. 2007**), (3) comprehensive health and nutrition with caregiver support component in Syria (**Bashour, Kharouf et al. 2008**), (4) community empowerment via positive deviance approach in Vietnam (**Schroeder, Pach et al. 2002**) and via participatory learning in India (**Tripathy, Nair et al. 2010**), and (4) social protection in the form of conditional cash transfers in Mexico (Behrman and Hodinott 2005). Six of the seven studies were RCTs. Only one study used home visiting. The common thread across these programmes was that they were mostly

delivered didactically by paraprofessionals. There was, however, considerable variation across programmes in terms of programmatic design and strategies.

Two community empowerment programmes differed in their design. One programme in Vietnam was designed as a community-based nutrition programme using the hearth model and the positive deviance approach (**Schroeder, Pach et al. 2002**). In this strategy, community members identify poor families with well-nourished children and document their caregiving behaviors—feeding practices, caring, and health-seeking behaviors (**Marsh and Schroeder 2002**). Programmers then design the intervention based on the adoption of these behaviors. The other programme was designed as a participatory learning programme in women's groups in India (**Tripathy, Nair et al. 2010**). In this programme, health committees were formed in both programme and control areas, allowing for community members to express their opinions of local health services. In programme but not in control areas, local women facilitated 20 monthly group meetings. Findings revealed no impact on anthropometric measures for the Vietnam programme but revealed that programme children less than 15 months and programme children who were more malnourished deteriorated significantly less than the control group (**Schroeder, Pach et al. 2002**). For the Indian programme, significant impact was found only on infant mortality rates, which was not an outcome under investigation in this review (**Tripathy, Nair et al. 2010**). No programme effects were found for maternal depression, illness indicators, and care-seeking behaviors. The findings from both programmes suggest that community empowerment programmes in and of themselves may not be as effective in improving child physical well-being and maternal caregiving behaviors beyond childhood survival. Other programming modalities, such as home visits may have to be combined with this programmatic approach to yield more positive programme impacts.

Another set of studies consisted of relatively low-dose programmes (between 1 and 9 sessions) and may have accounted for the lack of programme effectiveness. These were implemented in Niger (**Abdou, Munoz et al. 2010**), in China (**Strand, Peng et al. 2002**), and in Syria (**Bashour, Kharouf et al. 2008**). The hygiene promotion programme in Niger consisted of one to two village meetings (between one and two hours per meeting) facilitated by village health workers trained on the spread of trachoma and strategies to prevent its

transmission. At least one hand pump well with potable water was also constructed in each programme village. The rickets prevention programme in China consisted of doctors examining children for a total of nine exams and instructing caregivers on basic nutrition and vitamin D and calcium supplementation. In Syria, where postpartum care is rather ignored, Bashour and colleagues (2008) tested the efficacy of home visiting by registered midwives. First time mothers were randomly assigned into one of three conditions: (1) four home visits (1st, 3rd, 7th day after delivery + 4th week after delivery), (2) one home visit, or (3) no home visits.

Home visitation activities included physical examinations, educating mothers on postnatal care, and providing emotional support. Across all the mentioned low-dosage studies, no impacts on the outcomes of interest were detected (See Table 4 in Appendix 1).

Finally two studies conducted in Senegal and Mexico found no overall impacts but impacts were found based on sub-group analyses. Both studies garnered low quality scores (<50%). The programme in Senegal yielded a significant impact on dietary diversity but only for the oldest age group (24-35 months of age) (Gartner, Kameli et al. 2007). Moreover, the evaluation also yielded counterintuitive findings, favoring the control group. For instance, the control group had higher rates of immunization against measles, but only for the youngest age group (6-11 months of age), and greater rates of decline in wasting and being underweight than the programme group. The programme in Mexico was the evaluation of the conditional cash transfer programme, *PROGRESA*, on child height (Behrman and Hodinott 2005). Results of the intent-to-treat analyses showed no impact on height; however, after employing child fixed-effects estimates that accounted for unobserved heterogeneity correlated with access to nutrition supplements, the programme accounted for an increase of about one sixth inches per year. Note that in the previous section, *PROGRESA*'s effect on height was stronger among the youngest infants at baseline who lived in the poorest households (Rivera, Sotres-Alvarez et al. 2004).

Summary Overall, appropriate parental practices do not seem to improve if the modality is primarily didactic—lecture-style with no direct interactions with children, resulting in making changes in child development less likely. Moreover, community empowerment programmes as evidenced in the Vietnam positive deviance approach to community nutrition

and in the Indian participatory learning programme among women's groups were ineffective in improving health and nutrition outcomes beyond survival rates when implemented through only one modality. Additional modalities may be necessary such as home visitations to complement these programmes. In terms of dosage, low dosage programmes (between 1 and 9 sessions) that are delivered didactically are ineffective. Even home visitation, if it consists of a maximum of 4 sessions, is ineffective in impacting infant health and health practices of first time mothers. Finally, many of the studies reviewed have shown impacts on sub- groups by age, gender, or actual uptake.

3.2.4.2 Child Development and Parental Child Rearing Outcomes (n=7)

The discussion is comprised of three longitudinal follow-up studies, two child protection programmes, and two integrated health and development programmes. Except for two of the three follow-up studies, the rest were evaluations delivery of instruction was primarily didactic.

Longitudinal Follow-Up Evaluations. Three longitudinal follow-up evaluations of a breastfeeding promotion programme in Belarus (**Kramer, Fombonne et al. 2008**), a psychosocial stimulation programme in Jamaica (**Chang, Walker et al. 2002**), and an early care and stimulation programme in Turkey (**Kagitcibasi, Sunar et al. 2009**) make up this section. The study in Belarus was the 6.5-year follow-up of the PROBIT breastfeeding promotion programme (**Kramer, Fombonne et al. 2008**); the study in Jamaica was the eight-year follow up of 9-24 month old stunted children who were assigned randomly to receive either no intervention, supplementation only, stimulation only, or a combination of stimulation and supplementation (**Chang, Walker et al. 2002**); and the study in Turkey was the 22-year follow up study of TEEP (**Kagitcibasi, Sunar et al. 2009**). These three studies examined whether there were any sustained programme impacts on primarily behavioral adjustment outcomes. In the follow-up of PROBIT, no evidence of long-term intervention effects on child behavioral problems or maternal adjustment was found (**Kramer, Fombonne et al. 2008**). In the follow-up of Jamaican infants who were now between 11-12 years of age, no differences among the four conditions were detected in impacting parental or teacher

ratings of behavior and standardized tests of academic achievement (Chang, Walker et al. 2002). In the 22-year follow-up of TEEP children, no main effects on educational outcomes or social adjustment were detected (**Kagiticbasi, Sunar et al. 2009**).

Child Protection Programmes. Two studies examined child protection outcomes. They were very different in terms of study goals. The first study examined the efficacy of integrating postnatal visits into Swaziland's prevention of mother-to-child transmission (PMTCT) programme—a form of preventive intervention for HIV-positive women (Mazia, Narayanan et al. 2009). Health workers visited homes twice within one week of delivery to deliver counseling messages on basic preventive care, identification of danger signs, and appropriate care-seeking behaviors. The programme had no impact on mothers' recall of information on basic care and danger signs. Given that the model of training was a train-the-trainer model and that 43% of the staff were left untrained due to conflicting activities, this study underscores the importance of ensuring that the second level of trainees receive adequate training.

The second study examined the effects of prolonged swaddling, a common tradition in Mongolia, on child development (**Manaseki-Holland, Spier et al. 2010**). The hypothesis of the second study was, in fact, to accept the null hypothesis—that is, to prove that swaddling has no deleterious effects on child development. Programme mothers were instructed to follow a traditional Mongolian pattern of swaddling. The pattern of swaddling for the first two months were more intensive, but by 7 months, swaddling was restricted to times when infants were asleep. Compliance was monitored via home visits and diaries. Results demonstrated that no significant differences between programme and control infants were found in standardized tests of mental and psychomotor skills. Swaddling infants throughout infancy, therefore, had no detrimental effects on children's development.

Integrated Health and Development Programmes Two integrated health and development programmes were unsuccessful: the CONIN (Corporation for Childhood Nutrition) programme in Argentina and the Parental Education Programme in the Gambia. The

CONIN study in Argentina was a retrospective quasi-experimental study of children ages 5-17 exposed to the CONIN under-nutrition prevention centers (from 1996-2005) and those who were not exposed to the programme (**Ortiz-Andrellucchi, Peña-Quintana et al. 2009**). The study tested the effects of the programme on a host of anthropometric measures and child developmental outcomes. The Gambian study was a quasi-experimental evaluation of the Parental Education Programme at the end of a four-year period (Sidibeh 2008). Although both programmes were similar in their goal of promoting nutrition and psychosocial support and stimulation, they also differed in a few ways.

First, the target of intervention differed for both programmes. The CONIN programme targeted mothers whereas the Parental Education Programme targeted parents and other caregivers (including siblings) as well as community leaders and civil servants from different social sectors. Second, programmatic strategies differed also for both programmes. The CONIN programme consisted of nutrition workshops that included community gardens with the aim of teaching parents how to prepare nutritious foods as well as of home visits with the aim of providing support and education on the importance of stimulation and attachment relationships. On the other hand, the Parental Education Programme in the Gambia employed a two-pronged approach: (1) a comprehensive communication strategy with key messages on nutrition, health, water and sanitation, and child development and protection; and (2) the development of a comprehensive parental education (“train-the-trainer”) manual that served as a guide for training non-literate community volunteers. Community volunteers then conducted the programme in the form of focus group discussions. Different materials were generated to disseminate programme’s content (i.e. songs were developed that educated parents on the relationship between early learning and toys).

At the end of the programme period, no significant differences were found between programme and comparison groups (Sidibeh 2008; **Ortiz-Andrellucchi, Peña-Quintana et al. 2009**). Moreover, counter to hypotheses, the non-CONIN children had lower rates of visual impairment and higher levels of school achievement than CONIN children (**Ortiz-Andrellucchi, Peña-Quintana et al. 2009**). The non-significant findings of both studies may be attributed to their low quality score ratings (<50%) and to the fact that they were

primarily didactic with no mention of direct interactions with children. Program dosage information could not be determined in either programme.

Summary The studies reviewed here showed that breastfeeding promotion & psychosocial stimulation programmes have long term impacts on cognitive outcomes but not on social and emotional development. Breastfeeding promotion programmes have been shown to benefit extended breastfeeding, child health and growth, and mental development, but not to more distal outcomes such as child social and emotional adjustment and maternal well-being. Psychosocial stimulation programmes may have long term impacts on social and emotional outcomes if they are to be combined with preschool education as seen in the TEEP study. As a home visitation programme in itself, psychosocial stimulation programmes may not be as effective in improving children's social and emotional development in the long run. This finding suggests that the development of social and emotional skills and well-being requires programmes to target these skills directly and over time in contexts where children have to use them, e.g. preschool Programmes in the TEEP model. Evidence from social and emotional learning programmes suggest that teaching these skills require both quality delivery and positive attitudes of implementers to effectively impact children's social and emotional skills (**Reyes, Brackett, Rivers, Elbertson, & Salovey, 2012**).

In terms of evaluation design, quasi-experimental studies with low quality scores may not have been effective in finding a representative control group to match the intervention group. Finally, in evaluating our findings, one must take into consideration the distinction between immediate programme impacts and long-term follow-up impacts, and the distinction between pilots and scaled up programmes.

CHAPTER 4: DISCUSSION

There is tremendous diversity around the world in parenting approaches, philosophies and cultural constructions. However there are also a few universal properties and characteristics in parenting practices, primary among which is the function of parenting to nurture the survival, development and wellbeing of the child. This function is at risk for more than 1/3 of the world's youngest children as noted by lack of stimulating, responsive and safe parenting practices due to any number of individual and/or contextual factors. Parents, especially the most vulnerable ones, need to be supported in their role and ability to carry out the function of parenting. Therefore parenting support, education and training programmes need our attention to implement effective services to help parents and families.

The aim of this systematic review has been to synthesize the recent models of ECD parenting programmes, evaluate their effectiveness and identify programme characteristics that could be scaled up to promote effective, sensitive and responsive child rearing and caring practices, with a special focus on the most marginalized families and vulnerable children in support of UNICEF's equity approach, in a global context. One hundred and five articles were reviewed covering ECD parenting programmes from LMIC with a range in foci from health, nutrition, social protection, psychosocial support and early learning to programme modalities, delivery mechanisms, dose, and impact on improving child and parent outcomes.

In general, most reported programmes that met our inclusion criteria showed significant results in improving child and/or parenting outcomes. **ECD parenting programmes that aimed to promote nutrition and health (56.2%) and programmes aimed to promote domains of child development other than health (43.8%), of the total number of programmes that met the eligibility criteria for the current study.** This suggests that parenting programmes are making a difference in the lives of children and families. In this chapter we present our review and analyses of the results that emerged from effective

practices with the intention of informing implementation. We focus on the characteristics of effective ECD parenting programmes with the objective of making recommendations for the next generation of programming. The characteristics are presented in three sections: what we know works, knowledge gaps, and addressing vulnerable families.

4.1 WHAT WORKS IN PARENTING PROGRAMS

Across the review of the 105 articles, we identified 3 areas that are important to consider in designing and implementing effective parenting programmes: programme dose; programme quality and programme timing with respect to the age of the child.

4.1.1 Programme Dose

Dosage has been identified as important for programme effectiveness. However there is still a lack of consensus in the definition and measurement of dosage. Stated simply, dose is the amount of the programme that is delivered (Wasik, Mattera, Lloyd, & Boller, 2013). Following the accepted conceptualization of intervention dose, we review the three components: duration, frequency, and intensity.

Low dose programmes across duration, frequency and intensity yielded non-significant programme impacts. For example, the relatively low-dose programmes (between 1 and 9 sessions) for hygiene promotion in Niger (**Abdou, Munoz et al., 2010**), rickets prevention in China (Strand, Peng et al., 2002), and postpartum care in Syria (**Bashour, Kharouf et al., 2008**) had no impact on child or parent outcomes. The low dose, in part, may have accounted for the lack of programme effectiveness, making it an important component to consider in programming.

Duration is the length of the full programme from start to finish. Across the studies, tremendous variation was noted in the length of the parenting programmes. An analysis of

the results reveals that the optimal length of a parenting programme is linked to the types of results it is able to impact.

For improving child level outcomes, in domains of physical health, cognitive development and social and emotional development, the review suggests that 12 months is the minimum duration of a parenting programme. However, for programmes that were implemented over a 2-year period, more consistent impact was noted, in particular for vulnerable and disadvantaged populations. For example, the programme duration of an effective parenting programme implemented by Save the Children Japan in rural Vietnam, where there was a high prevalence of stunting, was two years (Watanabe, Flores et al., 2005). The cash transfer intervention in Mexico, *Oportunidades*, children in families who enrolled early or had an 18 month lead compared to children in the families who enrolled later did better on a range of holistic child outcomes (Fernald, Gertler et al., 2009). With respect to cognitive development, the Turkish Enrichment Programme, TEEP (Kagitcibasi, Sunar et al., 2001), consisted of 60 bi-weekly guided group discussions over two years. These examples illustrate that the recommended ECD parenting programme duration is 24 months to impact child developmental outcomes. For other outcomes such as oral health, it appears that low doses will suffice (e.g., Mohebbi et al., 2009; Pereira & Freire, 2004).

We also covered programmes that only reported on parent level outcomes. It appears that shorter duration programmes might work for parent level results. For example, programmes to reduce harsh discipline last only several months while those targeting to change child outcomes took 1 to 2 years. However such a comparison should be treated with caution, since child outcomes were measured in areas of health and development while parenting outcomes are measured in a different domain, such as discipline. Also, the latter is often measured in terms of change in knowledge but not with respect to change in behavior. Regardless, it appears that reviewed programmes that aim to change parenting knowledge could be shorter in duration compared to programmes that aim to improve results for children.

The second component of dose is frequency or how often the programme is delivered. As can be expected higher frequency parenting programmes were more effective in improving parent and child outcomes. The longitudinal results from parenting programmes are derived primarily from TEEP in Turkey and the psychosocial and nutrition intervention in Jamaica indicate that the programme frequency needs to be at least once a week. The Roving Caregivers programme in Jamaica was delivered twice per week, an even higher frequency.

There are three notable points with respect to parenting programme frequency. First, unlike duration, impacting parent or child outcomes requires a high frequency. Second, the frequency of the programme delivery needs to be matched with the frequency of the parents implementing in their daily life what they have learned. In the TEEP model, for example, mothers worked with their children 15-20 minutes a day. The frequency of parenting programmes need to have a follow up at home for the parents to do with children almost daily. Third, the frequency of the programme can be paced. For example the integrated early stimulation and nutrition programme (**Hamadani, Huda et al., 2006**) for malnourished populations varied programme frequency over the course of implementation. The programme consisted of weekly group meetings for 10 months followed by bi-weekly meetings for 2 months, and bi-weekly home visits for 8 months, followed by weekly home visits for 4 months. The programme was effective in improving parenting practices and child outcomes.

Intensity is the third component of dose and has been defined as the strength of an intervention or how much of the intervention is delivered within each session. With respect to intensity, we examine several characteristics.

First, the time allotted for each session is an indicator of intensity. Amongst studies that reported the time of each session, they appeared to have lasted for 45 to 60 minutes. For example, in the Jamaica intervention, each home visit was 1 hour long.

Second, with respect to intensity it is important to understand who is involved in the

session, such as the parent only or the parent and the child. Results from the review suggest that more intensive approaches, e.g., direct interaction with child, are needed to improve parenting level outcomes, for example, caregivers' ability to be emotionally responsive (Ertem, et al., 2006). In the case of the responsive feeding programme in Bangladesh, results indicated improvement in child weight and maternal feeding practices but not in cognitive and language development, when the programme targeted only parents. However when the programme involved children, their language ability was improved significantly (Aboud and Akhter, 2011). Therefore, involving children in the sessions could be an approach to increasing the programme intensity.

4.1.2 Programme Modality

Programme modality refers to the mode or manner in which the parenting programme was conducted.

From the review of studies, we found that modality of a programme is a key determinant in the theory of change. Modality of a programme influences the theory of change and consequently the programme outcome/s. For example, child cognitive outcomes were significantly improved across both home-based modalities and center-based programmes that used group settings. However it was the psychosocial stimulation aspect of the programmes, which entails active engagement between the caregiver and the child that was effective in improving children's cognitive development. Therefore, if the theory of change is used as the guiding factor then the programme modality (in this case, group settings and psychosocial stimulation) can be selected accordingly.

Besides the theory of change, the desired outcomes of the programme should influence the modality. For example, in the case of improving child protection, evidence from programmes in Brazil and Turkey showed that providing demonstrations or examples of contrasting approaches to safety are effective in informing parental practices of safety. (Issler, Marostica et al. 2009); (Özyazıcıoğlu, Polat et al. 2011). Group modalities were a more common approach to parenting programmes that are aimed at promoting child protection

through reducing harsh discipline. However, in the case of promoting breast feeding practices and health outcomes, home visits were found to be effective modalities. Therefore, decisions regarding the programme modality needs to be guided by the aims of the programme.

Furthermore, the number of modalities also provides an indication of programme strength or intensity. Across the reviewed studies, a consistent result was that programmes that used more than one modality achieved better results than programmes that only used one modality. For example, the studies that improved child physical health outcomes showed that group settings must be combined with other modalities. These findings suggest that by having parents exposed to multiple modalities for a long period of time, the message of appropriate and adequate nutrition gets reinforced. Therefore combining home visits with group sessions is more effective than only home visits or only group sessions (Engle, et al., 2011).

However, combining programme modalities is not an ad hoc arrangement of services. Rather, there needs to be criteria that guide the approach. Modalities need to be bridged. For example, in the Philippines (**Armecin, Behrman et al. 2006**), the center- and home-based services were linked by the CDWs who complemented the roles of midwives and health workers in providing food and nutritional supplements and monitoring children's health status. CDWs also provided community-based parenting education about ECD. In providing this bridge, the programme was able to maximize the strength or intensity of the dose to achieve impact on parent and child outcomes.

4.1.3 Service Provision

The third element of what works with parenting programmes is ensuring high quality programmes. One of the main features of quality as gleaned through the review is the service provider and their ability to deliver and maintain the programme effectively.

Authority figures, such as doctors, nurses, educators, for example were among the most successful service providers in improving parenting outcomes. For example, a significant increase in parenting knowledge was associated with professional service providers (**Moran, Ghate et al. 2004**). Nutrition education programmes were more effective when the professionals delivered the health messages. The reason why authority figures might be effective is because parents may interpret health care professionals as experts in the field and are therefore more amenable to listening to them and following their guidance.

However, the reality of the situation with respect to ECD programmes is that the vast majority of the programmes are delivered by community workers or paraprofessionals. The field as a whole is far from having a professional work force. Therefore in our review, we also examined community-based approaches to identify effective factors associated with services delivered by non-professionals or service providers with limited training.

Trained local female coordinators with relatively high levels of education were also effective in delivering the programme across home and in the group settings. These service providers though need fairly intensive training not only in the programme approach but also in terms of techniques. For example, both live modeling and direct instruction have been used with success to teach mothers how to interact with their children. These are techniques in which service providers need to be trained. These findings are consistent with those from non-LMIC, which revealed that strategies associated with improving both child and parent outcomes included: (i) training parents how to interact positively with their children on a daily basis (real-life everyday scenarios) and (ii) live modeling (practicing newly learned skills with their own child) vs. role-playing with a peer or trainer (**Kaminski, Valle et al. 2008**).

The community-based programmes that promote health and nutrition indicate that employing local leaders, e.g., the Imams in Bangladesh and community theatre actors with script written for the local community might be alternative strategies to consider (Arifeen et al., 2009). A common strategy used in the programmes reviewed capitalized on available community resources to deliver the programme. For example the Dular model in India

capitalized and developed community resources at the grassroots level to improve nutritional practices and decrease malnutrition (Dubowitz, Levinson et al. 2007).

In summary, one of the main issues of programme quality appear to be linked with the ability of the service provider and currently the vast majority of ECD parenting programmes use community workers or paraprofessionals to deliver services. The strategies for improving programme quality are still unclear, though strengthening the capacity of the service providers, using professionals and local leaders have been associated with significant positive results.

4.1.4 Timing of Programme

Given that the early years are a time of extraordinarily rapid growth and change, parents' interest in issues of child development is closely linked to the age of the child and the stage of their development. Certain types of nutritional programmes are more appropriate for certain age groups of children. Furthermore, given that child development has sensitive windows it is important to maximize the influence of parenting by designing programmes that are age appropriate.

In general, across the studies reviewed, there was no clear set of results with respect to programme timing and age of the child. However a few illustrative examples do provide guidance for programme design. One of the clearest examples for timing of a parenting intervention are breastfeeding programmes because they have to commence in the first moments of a child's life. Results from breastfeeding programmes did show results for improved health practices for mothers and for infants in terms of long-term benefits for their cognitive development and physical health. The psychosocial stimulation programmes ranged from when children were a few months old to almost 6 years of age. Therefore discerning the appropriate timing to commence a psychosocial intervention is challenging based on this review. Finally, in terms of developmental timing, impacts on anthropometry were stronger for children who were exposed to the programme when they were younger as seen in

the nutrition and health programme from Haiti (**Ruel, Menon et al. 2008, Donegan, Maluccio et al. 2010**).

4.2 KNOWLEDGE GAPS

The review has been incredibly informative in understanding what works for ECD parenting programmes to improve parent and child outcomes. However there are still several areas that need further research and examination, if we are to truly improve the effectiveness of programmes.

4.2.1 Social protection programmes and parenting

One of the largest influences on parenting is the availability of resources that allow parents to provide for their children in the best possible manner. Low-income families and those living in poverty are often at risk for poorer developmental outcomes and therefore in greater need of parenting interventions. Social protection programmes, such as cash transfer programmes are emerging as one of the most important means to reach poor families. Parenting programmes target the most vulnerable populations. Therefore cash transfer programmes are potentially effective mechanisms to deliver parenting education to these populations. The research from Mexico and Nicaragua suggests that such a combination may be very beneficial for the families because not only does it provide the financial resources that the parents need to raise their family but also the information and skills to use those funds and parent their children. Further research is needed to address the feasibility of integrating explicitly ECD parenting education into cash transfer programmes and assess their impacts on improving or mediating the effects of cash transfers on outcomes. The impacts of this approach on other outcome domains are reported in other sections of this review.

4.2.2 Maternal mental health

One of the significant influences on parenting is maternal mental health. However, few to none of the studies explicitly addressed this important mediator between programmes and child outcomes (Shaw et al., 2009). Although we excluded studies of programmes specifically targeting women diagnosed with depression and other health problems; two of the studies we found considered maternal depression as an area to address through their parenting programmes. Both programmes, however, were unsuccessful in alleviating maternal depression (Cooper et al., 2009; Rahman et al., 2009). Both programmes employed trained paraprofessionals, suggesting that addressing maternal depression may require more highly trained professionals. Alternatively, treating maternal depression may require more targeted programmes aimed specifically at this issue. This is an area for further work and inquiry.

4.2.3 Scaling Up of ECD Parenting Programmes

Most of the studies included in the review were based on small-scale demonstration programmes. There were a handful of studies that were based on scaled up programmes. In the studies, in general there was little information on scale-up. A few examples were presented that we draw on to present a set of conclusions. First, linking programmes to existing policies provided a mechanism to enhance policy implementation. Multisectoral partnerships have been noted as the key ingredient to programmatic success. The work from Ugandan and Senegalese programmes, which capitalized on the support of parish activities and a national multisectoral coordinating body, respectively, were successful in impacting rates of being underweight and parental caregiving behaviors (Alderman 2007; Alderman, Ndiaye et al. 2009). Nutrition education programmes that are integrated into existing programmes or structures such as nutrition services (**Penny, Creed-Kanashiro et al. 2005; Waters, Penny et al. 2006**) or early childhood services (**Ghoneim, Hassan et al. 2004**) are more effective. However such examples were few and far between.

Scaling up at the community level was also explored in the review. The results suggest that community empowerment programmes in and of themselves may not be as effective in improving child physical well-being and maternal caregiving behaviors beyond childhood survival. Other programming modalities, such as home visits may have to be combined with this programmatic approach to yield more positive programme impacts (**Schroeder, Pach et al. 2002; Tripathy, Nair et al. 2010**).

In general more research and evidence is needed in the implementation science of scaling up ECD Parenting programmes.

4.2.4 Role of Fathers in the Parenting Process

Fathers in general are under-studied in ECD parenting programmes (**Barker, Bartlett et al. 2004**, United Nations Department of Economic and Social Affairs 2011). Three studies across the entire review looked at fathers as recipients of parenting programmes. (Koçak 2004) (Al Hassan and Lansford 2011). Two of the three were on discipline. The results clearly indicate a much greater need to include fathers in parenting interventions, not merely as maternal support but as factors influencing child outcomes.

4.2.5 Next Generation Issues for ECD Parenting

Effective parenting programmes require a balance between supply of services and demand for services. Parenting is a demand side issue. But, across our review, no work had been completed on the demand side of parenting programmes.

A few studies examined increasing uptake of the programmes. For example the community- based programme in Brazil, when offering group sessions (in addition to home visits), recommended that transportation and refreshments should be provided. Other recommendations included providing convenient service, such as child care services while

parents are in attendance, or transportation services for rural families—as well as offering programmes at convenient locations (e.g., office, preschool, community centers) and times (including evenings and weekends when there is a demand) were examined as factors that increase participation rates (**Moran, Ghate et al. 2004**). However demand for ECD parenting programmes was not studied consistently.

Also the attention to child social and emotional outcomes was limited. In order to improve holistic outcomes for children, parenting programmes have to move beyond physical health and cognition. Although some studies did examine social and emotional development, they were in a minority.

4.2.6 Comprehensive and Contextual Measures

Regarding metrics and study designs, the systematic review also revealed that measures to assess the impact of programmes on the attitudes, practices and behaviors of parents consist primarily of self-reports, which present risks of reporting biases. Furthermore, there is virtually no presence of impact evaluations that address biophysiological impacts of programmes at the child level. Most physical effects address anthropometric indicators but ignore important dimensions such as biomarkers of stress and attachment. Longitudinal studies of ECD parenting programmes are lacking, in particular on outcomes linked with long-term health, prosocial behaviors, adult productivity, and other sustainable impacts associated with social transformation. Lastly, programme evaluations often do not control for macro-level covariates (e.g. access to services, presence or absence of conflict/displacement, environmental determinants, etc.), providing an incomplete picture of the context of the child.

4.3 EQUITY THROUGH PARENTING

Most parenting programmes address vulnerable families and clear results were noted for improving equity in child outcomes. For example, malnourished children and younger age groups benefited the most from these programmes (**Watanabe, Flores et al. 2005**). However the programmes also had to be of a higher quality. Malnourished populations benefited from services that involved professionals and experts (**Santos, Victora et al. 2001; Ghoneim, Hassan et al. 2004**) or a combination of professionals and paraprofessionals (**Penny, Creed- Kanashiro et al. 2005; Roy, Fuchs et al. 2005; Waters, Penny et al. 2006**). Since the situation of vulnerable populations is more complex there is a greater need for proficiency in the implementation process. For example, in Bangladesh, doctors received 20-hour training in nutrition counseling following the IMCI feeding guidelines (**Santos, Victora et al. 2001**) resulting in better maternal recall of dietary recommendations and maternal reported use of recommended foods and feeding practices. Although psychosocial stimulation programmes were effective in improving cognitive outcomes when targeting impoverished groups, malnourished children still performed well below their non-impoverished counterparts.

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OBJECTIVES: The goal of this study was to determine if a responsive stimulation and feeding intervention improved developmental and nutritional outcomes compared with a regular information-based parenting programme. The hypothesis was that mothers in the intervention would exhibit better parenting skills and children would exhibit better developmental and nutritional outcomes than controls. **METHODS:** A cluster-randomized field trial was conducted with 302 children aged 8 to 20 months and their mothers in rural Bangladesh who were randomly assigned according to village to 1 of 3 groups. The control mothers received 12 informational sessions on health and nutrition. The intervention groups received an additional 6 sessions delivered by peer educators who included modeling and coached practice in self-feeding and verbal responsiveness with the child during play. A second intervention group received, along with the sessions, 6 months of a food powder fortified with minerals and vitamins. Developmental outcomes included the Home Observation for Measurement of the Environment (HOME) Inventory, mother-child responsive talk, and language development. Nutritional outcomes included weight, height, self-feeding, and mouthfuls eaten. We used analysis of covariance to compare the 3 groups at the posttest and at follow-up, covarying the pretest levels and confounders. **RESULTS:** At follow-up, responsive stimulation-feeding groups had better HOME inventory scores, responsive talking, language, mouthfuls eaten, and hand-washing. Micronutrient fortification resulted in more weight gain. **CONCLUSIONS:** A brief behavior-change programme that focused on modeling and practice in stimulation and feeding was

*Note: Annotated references are a part of the systematic review.

found to benefit children's nutrition and language development. Micronutrients benefited children's weight but not length.

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It is unclear whether a substantial decline in malnutrition among infants in developing countries can be achieved by increasing food availability and nutrition counseling without concurrent morbidity-reducing interventions. The study was designed to determine whether provision of generous amounts of a micronutrient-fortified food supplement supported by counseling or nutritional counseling alone would significantly improve physical growth between 4 and 12 months of age. In a controlled trial, 418 infants 4 months of age were individually randomized to one of the four groups and followed until 12 months of age. The first group received a milk-based cereal and nutritional counseling; the second group monthly nutritional counseling alone. To control for the effect of twice-weekly home visits for morbidity ascertainment, similar visits were made in one of the control groups (visitation group); the fourth group received no intervention. The median energy intake from nonbreast milk sources was higher in the food supplementation group than in the visitation group by 1212 kJ at 26 wk ($P < 0.001$), 1739 kJ at 38 wk ($P < 0.001$) and 2257 kJ at 52 wk ($P < 0.001$). The food supplementation infants gained 250 g (95% confidence interval: 20–480 g) more weight than did the visitation group. The difference in the mean increment in length during the study was 0.4 cm (95% confidence interval: –0.1–0.9 cm). The nutritional counseling group had higher energy intakes ranging from 280 to 752 kJ at different ages ($P < 0.05$ at all ages) but no significant benefit on weight and length increments. Methods to enhance the impact of these interventions need to be identified.

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Complementary feeding practices are often inadequate in developing countries, resulting in a significant nutritional decline between 6 and 18 months of age. We assessed the effectiveness of an educational intervention to promote adequate complementary feeding practices that would be feasible to sustain with existing resources. The study was a cluster randomized controlled trial in communities in the

state of Haryana in India. We developed the intervention through formative research. Eight communities were pair matched on their baseline characteristics; one of each pair was randomly assigned to receive the intervention and the other no specific feeding intervention. Health and nutrition workers in the intervention communities were trained to counsel on locally developed feeding recommendations. Newborns were enrolled in all of the communities (552 in the intervention and 473 in the control) and followed up every 3 months to the age of 18 months. The main outcome measures were weights and lengths at 6, 9, 12, and 18 months and complementary feeding practices at 9 and 18 months. All analyses were by intent to treat. In the overall analyses, there was a small but significant effect on length gain in the intervention group (difference in means 0.32 cm, 95% CI, 0.03, 0.61). The effect was greater in the subgroup of male infants (difference in mean length gain 0.51 cm, 95% CI 0.03, 0.98). Weight gain was not affected. Energy intakes from complementary foods overall were significantly higher in the intervention group children at 9 months (mean \pm SD: 1556 \pm 1109 vs. 1025 \pm 866 kJ; $P < 0.001$) and 18 months (3807 \pm 1527 vs. 2577 \pm 1058 kJ; $P < 0.001$). Improving complementary feeding practices through existing services is feasible but the effect on physical growth is limited. Factors that limit physical growth in such settings must be better understood to plan more effective nutrition programmes.

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BACKGROUND: Stunting in early childhood is common in developing countries and is associated with poorer cognition and school achievement in later childhood. The effect of stunting on children's behaviors is not as well established and is examined here. **METHOD:** Children who were stunted at age 9 to 24 months and had taken part in a 2-year intervention Programme of psychosocial stimulation with or without nutritional supplementation were reexamined at age 11–12 years and compared with nonstunted children from the same neighbourhoods. Their school and home behaviors were assessed using the Rutter Teacher and Parent Scales and school achievement was measured using the Wide Range Achievement Test (WRAT) and the Suffolk Reading Scales. **RESULTS:** No significant intervention effects were found among the stunted groups. Thus data from the four intervention groups were aggregated for subsequent analyses, comparing all 116 stunted children with 80 non-stunted children. Controlling for social background variables, the stunted

group had more conduct difficulties ($p < .05$) as rated by their parents. They also had significantly lower scores in arithmetic, spelling, word reading and reading comprehension than the non-stunted children (all $p < .001$). Conduct difficulties and

hyperactivity were related to poorer school achievement. Controlling for the children's IQ, the stunted children's arithmetic scores remained significantly lower than those of the non-stunted children, but reading and spelling scores were not different. Conclusions: Previously stunted children had more conduct difficulties at home, regardless of their social background, than non-stunted children. Their educational attainment was also poorer than non-stunted children and these results are suggestive of a specific arithmetic difficulty. Children with behavior problems performed less well at school. [ABSTRACT FROM AUTHOR]

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Epidemiology 37(3): 549-558.

BACKGROUND: The International Trachoma Initiative (ITI) trachoma control Programme based on the SAFE strategy (Surgery, Antibiotics, Facial cleanliness and Environmental improvement) was implemented in 2002 in two rural Ethiopian zones, with mass delivery of azithromycin starting in 2003. We evaluate the impact of combined antibiotic and health educational interventions on active trachoma and *Chlamydia trachomatis* detected from ocular swabs, in children aged 3–9 years. **METHOD:** Three-year follow-up cross-sectional survey was carried out in 40 rural Ethiopian communities to evaluate the Programme. Households were randomly selected and all children were invited for eye examination for active trachoma. In 2005, eye swabs were taken for Polymerase Chain Reaction (PCR) detection of ocular *C. trachomatis* DNA. Adult knowledge and behavior related to trachoma were assessed. **RESULTS:** Community summarized mean prevalence, overall, was 35.6% (SD = 17.6) for active trachoma, 34.0% (18.7) for trachomatous inflammation, follicular (TF) alone and 4.3% (5.3) for PCR positivity for *C. trachomatis*. After adjustment, odds of active trachoma were reduced in communities receiving antibiotics and one or two educational intervention components (OR = 0.35, 95% CI:0.13–0.89 or OR = 0.31, 0.11–0.89, respectively). The odds of being PCR positive were lower in these intervention arms, compared with control (OR = 0.20, 0.06–0.62 and OR = 0.07, 0.02–0.30, respectively). Knowledge of treatment and preventative methods were reported with much higher frequency, compared with baseline. **CONCLUSIONS:** Trachoma remains a public health problem in Ethiopia. Antibiotic administration remains the most effective intervention but community-based health education programmes can impact, to additionally reduce prevalence of *C. trachomatis*.

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*Donegan, S., et al. (2010). "Two food-assisted maternal and child health nutrition programmes helped mitigate the impact of economic hardship on child stunting in Haiti." *The Journal of Nutrition* 140(6): 1139-1145.

Rigorous evaluations of food-assisted maternal and child health and nutrition programmes are stymied by the ethics of randomizing recipients to a control treatment. Using nonexperimental matching methods, we evaluated the effect of 2

such programmes on child linear growth in Haiti. The 2 well-implemented programmes offered the same services (food assistance, behavior change communication, and preventive health services) to pregnant and lactating women and young children. They differed in that one (the preventive programme) used blanket targeting of all children 6–23 months, whereas the other (the recuperative programme) targeted underweight (weight-for-age Z score < -2) children 6–59 months, as traditionally done. We estimated programme effects on height-for-age Z scores (HAZ) and stunting (HAZ < -2) by comparing outcomes of children in programme areas with matched children from comparable populations in the Haiti Demographic and Health Survey. Children 12–41 mo in the preventive and recuperative programme areas had lower prevalence of stunting than those in the matched control group [16 percentage points (pp) lower in preventive and 11 pp in recuperative]. Children in the 2 programme areas also were more likely than those in the matched control group to be breast-fed up to 24 months (25 pp higher in preventive, 22 in recuperative) and children 12 months and older were more likely to have received the recommended full schedule of vaccinations (32 pp higher in preventive, 31 in recuperative). Both programmes improved targeted behaviors and protected child growth in a time of deteriorating economic circumstances.

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*Durlak, J. A., et al. (2011). "The impact of enhancing students' social and emotional learning: A meta-analysis of school-based universal interventions." *Child Development* 82(1): 405-432.

This article presents findings from a meta-analysis of 213 school-based, universal social and emotional learning (SEL) programmes involving 270,034 kindergarten through high school students. Compared to controls, SEL participants demonstrated significantly improved social and emotional skills, attitudes, behavior, and academic performance that reflected an 11-percentile-point gain in achievement. School teaching staff successfully conducted SEL programmes. The use of 4 recommended practices for developing skills and the presence of implementation problems moderated programme outcomes. The findings add to the growing empirical evidence regarding the positive impact of SEL programmes. Policy makers, educators, and the public can contribute to healthy development of

children by supporting the incorporation of evidence-based SEL programming into standard educational practice. [ABSTRACT FROM AUTHOR]

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*Ertem, I. O., et al. (2006). "Promoting child development at sick-child visits: A controlled trial." *Pediatrics* 118(1): e124-e131.

OBJECTIVE. In developing countries, the health care system often is the only existing infrastructure that can reach young children, and health care encounters may be the only opportunity for professionals to have a positive influence on child development. To address the discrepancy between Western and developing countries related to the information that is available for caregivers on how to support their child's development, the World Health Organization Department of Child and Adolescent Health and Development and United Nations International

Children's Education Fund have developed the Care for Development Intervention.

The Care for Development Intervention aims during acute health visits to enhance caregivers' play and communication with their children. For facilitation of its delivery worldwide, the Care for Development Intervention was developed as an additional module of the Integrated Management of Childhood Illness training course. The purpose of this study was to determine the efficacy and the safety of the Care for Development Intervention when implemented during a young child's visit for acute minor illness. **METHODS.** The study design is a sequentially conducted controlled trial, with the comparison arm completed first, Care for Development Intervention training provided for the clinicians next, followed by the intervention arm. At the Pediatric Department of Ankara University School of Medicine, 2 pediatricians who were blinded to the study aims and hypotheses before Care for Development Intervention training provided standard health care to the comparison group; they then received Care for Development Intervention training and provided standard health care plus the Care for Development Intervention to the intervention group. Compliance with treatment and the outcome of illness were determined by a follow-up examination in the clinic 1 week later. One month after the clinic visits, an adapted Home Observation for Measurement of the Environment was administered in the homes by researchers who were blinded to study aims and hypotheses. **RESULTS.** Children who were aged ≤ 24 months and attended the clinic with minor or no illnesses were recruited for the study: 113 in the comparison group and 120 in the intervention group. At the 1-month home visit, significantly more families had optimal Home Observation for Measurement of the Environment scores (17.5% vs 6.2%), more homemade toys were observed (42.5% vs 10.6%), and more caregivers reported reading to their children (20.0% vs 3.5%) in the intervention than in the comparison group. Three independent predictors of optimal Home Observation for Measurement of the Environment score emerged from the logistic regression analysis: being in the intervention group, child ages >6 months, and maternal education greater than secondary school. Compliance with medical treatment and illness outcomes were not significantly different between the 2 groups. **CONCLUSIONS.** The Care for Development Intervention is an effective method of supporting caregivers' efforts to provide a more stimulating environment for their children and can be used by health care professionals during visits for acute minor illness.

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*Gaboulaud, V., et al. (2007). "Could Nutritional Rehabilitation at Home Complement or Replace Centre-Based Therapeutic Feeding Programmes for Severe Malnutrition?" *Journal of Tropical Pediatrics* 53(1): 49-51.

To measure the success rate of three different strategies used in Médecins Sans Frontières large-scale therapeutic nutritional rehabilitation Programme in Niger, we analysed three cohorts of severely malnourished patients in terms of daily weight gain, length of stay, recovery, case fatality and defaulting. A total of 1937 children aged 6–59 months were followed prospectively from 15 August 2002 to 21 October 2003. For the three cohorts, 660 children were maintained in the therapeutic

feeding centre (TFC) during the entire treatment, 937 children were initially treated at the TFC and completed treatment at home and 340 children were exclusively treated at home. For all cohorts, average time in the Programme and average weight gain met the international standards (30–40 days, >8 g/kg/day). Default rates were 28.1, 16.8 and 5.6% for TFC only, TFC plus home-based and home-based alone strategies, respectively. The overall case fatality rate for the entire Programme was 6.8%. Case fatality rates were 18.9% for TFC only and 1.7% for home-based alone. No deaths were recorded in children transferred to rehabilitation at home. This study suggests that satisfactory results for the treatment of severe malnutrition can be achieved using a combination of home and hospital-based strategies.

Gardner, J. M., et al. (2003). "A randomized controlled trial of a home-visiting intervention on cognition and behavior in term low birth weight infants." *The Journal of Pediatrics* 143(5): 634-639.

*Gardner, J. M. M., et al. (2005). "Zinc supplementation and psychosocial stimulation: effects on the development of undernourished Jamaican children." *The American Journal of Clinical Nutrition* 82(2): 399-405.

BACKGROUND: Undernourished children have poor levels of development that benefit from stimulation. Zinc deficiency is prevalent in undernourished children and may contribute to their poor development. **Objective:** We assessed the effects of zinc supplementation and psychosocial stimulation given together or separately on the psychomotor development of undernourished children. **DESIGN:** This was a randomized controlled trial with 4 groups: stimulation alone, zinc supplementation alone, both interventions, and control (routine care only). Subjects were 114 children aged 9–30 months and below –1.5 z scores of the National Center for Health Statistics weight-for-age references who were recruited from 18 health clinics. Clinics were randomly assigned to receive stimulation or not; individual children were randomly assigned to receive zinc or placebo. The stimulation programme comprised weekly home visits during which play was demonstrated and maternal- child interactions were encouraged. The supplementation was 10 mg Zn as sulfate daily or placebo. Development (assessed by use of the Griffiths Mental Development Scales), length, and weight were measured at baseline and 6 mo later. Weekly morbidity histories were taken. **RESULTS:** Significant interactions were found between zinc supplementation and stimulation. Zinc benefited the developmental quotient only in children who received stimulation, and benefits from zinc to hand and eye coordination were greater in stimulated children. Zinc supplementation alone improved hand and eye coordination, and stimulation alone benefited the developmental quotient, hearing and speech, and performance. Zinc supplementation also reduced diarrheal morbidity but did not significantly improve

growth. CONCLUSION: Zinc supplementation benefits development in undernourished children, and the benefits are enhanced if stimulation is also provided.

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Martin, L. (2009). Implementing an integrated nutrition package at large scale in Madagascar: the Essential Nutrition Actions framework. *Food & Nutrition Bulletin*, 30(3), 233-244.

*Hamadani, J. D., Huda S. N., Khatun, F. & Grantham-McGregor S. M. (2006). "Psychosocial stimulation improves the development of undernourished children in rural Bangladesh." *The Journal of Nutrition* 136(10): 2645-2652.

Undernutrition in early childhood is associated with poor mental development and affects 45% of children in Bangladesh. Although limited evidence shows that psychosocial stimulation can reduce the deficits, no such interventions have been reported from Bangladesh. The Bangladesh Integrated Nutrition Programme (BINP) has provided nutrition supplementation to undernourished children through community nutrition centers (CNCs). We added psychosocial stimulation to the treatment of undernourished children in a randomized controlled trial to assess the effects on children's development and growth and mothers' knowledge. Twenty CNCs were randomly assigned to intervention or control groups with 107 children in each group. We also studied 107 nonintervened better-nourished children from the same villages. Pre- and postintervention measurements included children's height, weight, development assessed on Bayley Scales, behavior ratings during the test, and a questionnaire on mothers' knowledge of childrearing. The intervention comprised home visits and group meetings with mothers and children for 12 mo. Intervention benefited children's mental development (4.6 ± 2.0 , $P = 0.02$), vocalization (0.48 ± 0.23 , $P = 0.04$), cooperation (0.45 ± 0.16 , $P = 0.005$), response-

to-examiner (0.50 ± 0.15 , $P = 0.001$), emotional tone (0.33 ± 0.15 , $P = 0.03$), and mothers' knowledge (3.5 ± 0.49 , $P < 0.001$). At the end, undernourished controls had

poorer mental (-4.6 ± 2.0 , $P = 0.02$) and motor (-6.6 ± 2.2 , $P = 0.003$) development, were more inhibited (-0.35 ± 0.16 , $P = 0.03$), fussier (-0.57 ± 0.16 , $P < 0.001$), less cooperative (-0.48 ± 0.17 , $P = 0.005$), and less vocal (-0.76 ± 0.23 , $P = 0.001$) than better-nourished children. Intervened children scored lower only in motor development (-4.4 ± 2.3 , $P = 0.049$). Neither group of undernourished children improved in nutritional status, indicating that treatment had no effect. In conclusion, adding child development activities to the BINP improved children's development and behavior and their mothers' knowledge; however, the lack of improvement in growth needs to be examined further.

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Hotz, C., & Gibson, R. S. (2004). Participatory nutrition education and adoption of new feeding practices are associated with improved adequacy of complementary diets among rural Malawian children: a pilot study. *European journal of clinical nutrition*, 59(2), 226-237.

Imdad, A., et al. (2011). "Effect of breastfeeding promotion interventions on breastfeeding rates, with special focus on developing countries." *BMC Public Health* 11(Suppl 3): S24.

Issler, R. M. S., et al. (2009). "Infant sleep position: A randomized clinical trial of an educational intervention in the maternity ward in Porto Alegre, Brazil." *Birth* 36(2): 115-121.

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*Jin, X., et al. (2007). "Care for Development" intervention in rural China: A prospective follow-up study." *Journal of Developmental & Behavioral Pediatrics* 28(3): 213-218

210.1097/dbp.1090b1013e31802d31410b.

OBJECTIVE: The aim of this study was to test the efficacy and appropriateness of the World Health Organization's Care for Development (CFD) counseling materials, which form part of the Integrated Management of Childhood Illness (IMCI) strategy. The CFD materials are based on the Mother's Card, which contained age-specific messages on how caregivers can better play and communicate with a child.

METHOD: We enrolled 100 families with a child of younger than 2 years of age from seven randomly selected villages in an impoverished rural county in Anhui Province, China. Two counseling sessions, using the CFD Mother's Card, were provided to 50 families randomly selected from among the study participants. All children were assessed with Gesell Developmental Schedules before counseling and after 6 months. A questionnaire on family situation and knowledge, attitudes, and practices regarding child development was also administered at the start and conclusion of the study.

RESULTS: At baseline assessment, both control and intervention groups were equal, with average developmental scores less than the national norms. Children in families who received counseling had significantly higher development quotient scores in cognitive, social, and linguistic domains. Questionnaire data on child rearing suggested that responsive and rich interactions and consistent caregivers correlated with higher scores. The CFD Mother's Card was found to be feasible and helpful in those families who received counseling.

CONCLUSION: There is urgent need for further work on promotion of child development in rural China. The World Health Organization's CFD approach and Mother's Card is feasible and effective and should be expanded in use, especially within the national IMCI programme. (C) 2007 Lippincott Williams & Wilkins, Inc.

Kagan, S. L., et al. (1995). Reconsidering children's early development and learning: Towards common views and vocabulary. Washington, DC, National Educational Goals Panel.

Kagitcibasi, C., Sunar, D., & Bekman, S. (2001). "Long-term effects of early intervention: Turkish low-income mothers and children." *Journal of Applied Developmental Psychology* 22(4): 333-361.

Kagitcibasi, C., Sunar, D., Bekman, S., Baydar, N., & Cemalcilar, Z. (2009). "Continuing effects of early enrichment in adult life: The Turkish Early Enrichment Project 22 years later." *Journal of Applied Developmental Psychology* 30(6): 764-779.

*Kalimbira, A. A., et al. (2010). "The impact of an integrated community-based micronutrient and health Programme on stunting in Malawian preschool children." *Public Health Nutrition* 13(05): 720-729.

OBJECTIVE: To assess the impact of the 1996–2005 integrated community-based micronutrient and health (MICAHA) Programme on linear growth retardation (stunting) in Malawian preschool children living in rural areas. **Design** Prospective study of three large-scale cross-sectional surveys conducted in 1996, 2000 and 2004 in MICAHA and Comparison populations. **SETTING:** Rural areas in Malawi. **SUBJECTS:** Preschool children (6.0–59.9 months) from randomly selected households (474 from the 1996 baseline survey; 1264 from 2000 MICAHA areas; 1500 from 2000 Comparison areas; 1959 from 2004 MICAHA areas; and 1008 from 2004 Comparison areas), who responded to a household questionnaire, were weighed and measured using standard protocols. **RESULTS:** At the baseline in 1996, the prevalence of stunting (60.2 %) was very high. By 2000, the prevalence of stunting had declined to 50.6 % and 56.0 % ($\chi^2 = 7.8$, $P = 0.005$) in MICAHA and Comparison areas, respectively. In 2004, the prevalence of stunting did not differ significantly between MICAHA and Comparison areas (43.0 % v. 45.1 %; $\chi^2 = 1.11$, $P = 0.3$). Severe stunting affected 34.7 % of children at baseline, which declined to 15.8 % and 17.1 % ($\chi^2 = 0.86$, $P = 0.4$) in MICAHA and Comparison areas, respectively, by 2004. Regional variations existed, with proportionately fewer children from the Northern region being stunted compared to their Central and Southern region counterparts. **CONCLUSION:** Given the length of implementation, wide-scale coverage and positive impact on child growth in Phase I (1996–2000), the MICAHA Programme is a potential model for combating linear growth retardation in rural areas in Malawi, although the catch-up improvement in Comparison areas during Phase II (2000–2004) cannot be adequately explained.

*Kaminski, J. W., et al. (2008). "A meta-analytic review of components associated with parent training programme effectiveness." *Journal of Abnormal Child Psychology: An official publication of the International Society for Research in Child and Adolescent Psychopathology* 36(4): 567-589.

This component analysis used meta-analytic techniques to synthesize the results of 77 published evaluations of parent training programmes (i.e., programmes that included the active acquisition of parenting skills) to enhance behavior and adjustment in children aged 0-7. Characteristics of programme content and delivery method were used to predict effect sizes on measures of parenting behaviors and children's externalizing behavior. After controlling for differences attributable to research design, programme components consistently associated with larger effects included increasing positive parent-child interactions and emotional communication skills, teaching parents to use time out and the importance of parenting consistency, and requiring parents to practice new skills with their children during parent training sessions. Programme components consistently associated with smaller effects included teaching parents problem solving; teaching parents to promote children's cognitive, academic, or social skills; and providing other, additional services. The results have

implications for selection and strengthening of existing parent training programmes. (PsycINFO Database Record (c) 2010 APA, all rights reserved) (journal abstract)

*Kapil, U. (2002). "Integrated child development services (ICDS) scheme: A programme for holistic development of children in India." *Indian Journal of Pediatrics* 69(7): 597-601.

The Integrated Child Development Services (ICDS) scheme is the largest programme for promotion of maternal and child health and nutrition not only in India but in the whole world. The scheme was launched in 1975 in pursuance of the National Policy for Children. The scheme has expanded in the last twenty-seven years from 33 projects to 5171 blocks. ICDS is a multi-sectoral programme and involves several government departments. The programme services are coordinated at the village, block, district, state and central government levels. The primary responsibility for the implementation of the programme lies with the Department of Women & Child Development at the Centre and nodal department at the states, which may be Social Welfare, Rural Development, Tribal Welfare or Health Department or an independent Department. The beneficiaries are children below 6 years, pregnant and lactating women and women in the age group of 15 to 44 yrs. The beneficiaries of ICDS are to a large extent identical with those under the Maternal and Child Health Programme. The programme provides an integrated approach for converging all the basic services for improved childcare, early stimulation and learning, health and nutrition, water and environmental sanitation aimed at the young children, expectant and lactating mothers, other women and adolescent girls in a community. ICDS programme is the reflection of the Government of India to effectively improve the nutrition and health status of underprivileged section of the population through direct intervention mechanism. The programme covers 27.6 million beneficiaries with supplementary nutrition. The programme services and beneficiaries has essentially remained the same since 1975. Recently a review of the scheme was held, sponsored by Government of India, which suggested modifications in the health and nutrition component of ICDS scheme to improve the programme implementation and efficiency

*Kendrick, D., et al. (2007). "Parenting interventions for the prevention of unintentional injuries in childhood." *Cochrane Database of Systematic Reviews* (4).

BACKGROUND Parent education and training Programmes can improve maternal psychosocial health, child behavioral problems and parenting practices. This review assesses the effects of parenting interventions for reducing child injury. Objectives To assess the effects of parenting interventions for preventing unintentional injury as well as increasing possession and use of safety equipment and parental safety practices. **SEARCH STRATEGY** We searched CENTRAL, MEDLINE, EMBASE, Biological Abstracts, Psych INFO, Sociofile, Social Science Citation Index, CINAHL,

Dissertation Abstracts, ERIC, DARE, ASSIA, Web of Science, SIGLE and ZETOC. We also handsearched abstracts from the World Conferences on Injury Prevention & Control and the journal Injury Prevention. The searches were conducted in May 2005. Selection criteria We included randomised controlled trials (RCTs), non-randomised controlled trials (non-RCTs) and controlled before and after studies (CBAs), which evaluated parenting interventions administered to parents of children aged 18 years and under, and reported outcome data on injuries (unintentional or unspecified intent), and possession and use of safety equipment or safety practices. Parenting interventions were defined as those with a specified protocol, manual or curriculum aimed at changing knowledge, attitudes or skills covering a range of parenting topics. DATA COLLECTION AND ANALYSIS Studies were selected, data were extracted and quality appraised independently by two authors. Pooled relative risks (RR) were estimated using random effect models. Main results Fifteen studies were included in the review: 11 RCTs (one included a CBA within the same study), one non-RCT, one study contained both randomised and non-randomised arms and two CBAs. Two provided solely educational interventions. Thirteen provided interventions comprising parenting education and other support services; 11 of which were home visiting Programmes and two of which were paediatric practice-based interventions. Thirteen studies recruited families at risk of adverse child health outcomes. Nine RCTs were included in the primary meta-analysis, which indicated that intervention families had a significantly lower risk of injury (RR 0.82, 95% CI 0.71 to 0.95). Several studies found fewer home hazards, a home environment more conducive to child safety, or a greater number of safety practices in intervention families. AUTHORS' CONCLUSIONS Parenting interventions, most commonly provided within the home using multi-faceted interventions may be effective in reducing child injury. The evidence relates mainly to interventions provided to families at risk of adverse child health outcomes. Further research is required to explore mechanisms by which these interventions reduce injury, the features of parenting interventions that are necessary or sufficient to reduce injury and the generalisability to different population groups.

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Knitzer, J., et al. (2008). Reducing maternal depression and its impact on young children: Toward a responsive early childhood policy framework. New York City, National Center for Children in Poverty, Mailman School of Public Health, Columbia University.

Koçak, A. (2004). Evaluation report of the Father Support Programme. Turkey, Mother Child Education Foundation.

*Kramer, M. S., et al. (2008). "Breastfeeding and child cognitive development: new evidence from a large randomized trial." *Archives of General Psychiatry* 65(5): 578-584.

CONTEXT The evidence that breastfeeding improves cognitive development is based almost entirely on observational studies and is thus prone to confounding by subtle behavioral differences in the breastfeeding mother's behavior or her interaction with the infant. **OBJECTIVE** To assess whether prolonged and exclusive breastfeeding improves children's cognitive ability at age 6.5 years. **Design** Cluster-randomized trial, with enrollment from June 17, 1996, to December 31, 1997, and follow-up from December 21, 2002, to April 27, 2005. **Setting** Thirty-one Belarussian maternity hospitals and their affiliated polyclinics. **Participants** A total of 17 046 healthy breastfeeding infants were enrolled, of whom 13 889 (81.5%) were followed up at age 6.5 years. **Intervention** Breastfeeding promotion intervention modeled on the Baby-Friendly Hospital Initiative by the World Health Organization and UNICEF. **Main Outcome Measures** Subtest and IQ scores on the Wechsler Abbreviated Scales of Intelligence, and teacher evaluations of academic performance in reading, writing, mathematics, and other subjects. **RESULTS** The experimental intervention led to a large increase in exclusive breastfeeding at age 3 months (43.3% for the experimental group vs 6.4% for the control group; $P < .001$) and a significantly higher prevalence of any breastfeeding at all ages up to and including 12 months. The experimental group had higher means on all of the Wechsler Abbreviated Scales of Intelligence measures, with cluster-adjusted mean differences (95% confidence intervals) of +7.5 (+0.8 to +14.3) for verbal IQ, +2.9 (-3.3 to +9.1) for performance IQ, and +5.9 (-1.0 to +12.8) for full-scale IQ. Teachers' academic ratings were significantly higher in the experimental group for both reading and writing. **CONCLUSION** These results, based on the largest randomized trial ever conducted in the area of human lactation, provide strong evidence that prolonged and exclusive breastfeeding improves children's cognitive development. **Trial Registration** isrctn.org Identifier: ISRCTN37687716

*Kramer, M. S., et al. (2008). "Effects of prolonged and exclusive breastfeeding on child behavior and maternal adjustment: Evidence from a large, randomized trial." *Pediatrics* 121(3): e435-e440.

OBJECTIVE. The objective of this study was to assess the long-term effects of breastfeeding on child behavior and maternal adjustment. **METHODS.** We followed up children who were in the Promotion of Breastfeeding Intervention Trial, a cluster-randomized trial of a breastfeeding promotion intervention based on the World Health Organization/United Nations Children's Fund Baby-Friendly Hospital Initiative. A total of 17046 healthy, breastfeeding mother–infant pairs were enrolled from 31 Belarussian maternity hospitals and affiliated polyclinics; 13889 (81.5%)

were followed up at 6.5 years. Mothers and teachers completed the Strengths and Difficulties Questionnaire and supplemental questions bearing on internalizing and externalizing behavioral problems. Mothers also responded to questions concerning their relationships to their partner and child and their breastfeeding of subsequently born children. RESULTS. The experimental intervention led to a large increase in exclusive breastfeeding at 3 months (43.3% vs 6.4%) and a significantly higher prevalence of any breastfeeding at all ages up to and including 12 months. No significant treatment effects were observed on either the mother or the teacher Strengths and Difficulties Questionnaire ratings of total difficulties, emotional symptoms, conduct problems, hyperactivity, peer problems, or prosocial behavior or on the supplemental behavioral questions. We found no evidence of treatment effects on the parent's marriage or on the mother's satisfaction with her relationships with her partner or child, but the experimental intervention significantly increased the duration of any breastfeeding, and mothers in the experimental group were nearly twice as likely to breastfeed exclusively the next-born child for at least 3 months. CONCLUSIONS. On the basis of the largest randomized trial ever conducted in the area of human lactation, we found no evidence of risks or benefits of prolonged and exclusive breastfeeding for child and maternal behavior. Breastfeeding promotion does, however, favorably affect breastfeeding of the subsequent child.

Kumar, V., Mohanty, S., Kumar, A., Misra, R. P., Santosham, M., Awasthi, S., ... & Darmstadt, G. L. (2008). Effect of community-based behavior change management on neonatal mortality in Shivgarh, Uttar Pradesh, India: a cluster-randomised controlled trial. *The Lancet*, 372(9644), 1151-1162.

Lamberti, L. M., et al. (2011). "Breastfeeding and the risk for diarrhea morbidity and mortality." *BMC Public Health* 11(Suppl 3): S15.

Lansford, J. E. and K. Deater-Deckard (2012). "Childrearing discipline and violence in developing countries." *Child Development* 83(1): 62-75.

Lansford, J. E., & Bornstein, M. H. (2007). Review of parenting programmes in developing countries. New York: UNICEF.

le Roux, I., et al. (2010). "Home visits by neighborhood Mentor Mothers provide timely recovery from childhood malnutrition in South Africa: results from a randomized controlled trial." *Nutrition Journal* 9(1): 1-10.

Levy, S. (2006). Progress against poverty: Sustaining Mexico's Progresa-Oportunidades programme. Washington, DC, Brookings Institute Press.

Lindert, K. (2005). Reducing poverty and inequality in Latin America: The promise of conditional cash transfers. Washington, DC, The World Bank.

Lozoff, B., Beard, J., Connor, J., Felt, B., Georgieff, M. & Schallert, T. (2006). "Long-lasting neural and behavioral effects of iron deficiency in infancy." *Nutrition Reviews* 64: S34-S43.

*Luby, S. P., et al. (2004). "Effect of intensive handwashing promotion on childhood diarrhea in high-risk communities in Pakistan: A randomized controlled trial." *JAMA: The Journal of the American Medical Association* 291(21): 2547-2554.

CONTEXT Washing hands with soap prevents diarrhea, but children at the highest risk of death from diarrhea are younger than 1 year, too young to wash their own hands. Previous studies lacked sufficient power to assess the impact of household handwashing on diarrhea in infants. **OBJECTIVE** To evaluate the effect of promoting household handwashing with soap among children at the highest risk of death from diarrhea. **Design, Setting, and Participants** A cluster randomized controlled trial of 36 low-income neighborhoods in urban squatter settlements in Karachi, Pakistan. Field workers visited participating households at least weekly from April 15, 2002, to April 5, 2003. Eligible households located in the study area had at least 2 children younger than 15 years, at least 1 of whom was younger than 5 years. **INTERVENTIONS** Weekly visits in 25 neighborhoods to promote handwashing with soap after defecation and before preparing food, eating, and feeding a child. Within intervention neighborhoods, 300 households (1523 children) received a regular supply of antibacterial soap and 300 households (1640 children) received plain soap. Eleven neighborhoods (306 households and 1528 children) comprised the control group. **MAIN OUTCOME MEASURE** Incidence density of diarrhea among children, defined as the number of diarrheal episodes per 100 person-weeks of observation. **RESULTS** Children younger than 15 years living in households that received handwashing promotion and plain soap had a 53% lower incidence of diarrhea (95% confidence interval [CI], -65% to -41%) compared with children living in control neighborhoods. Infants living in households that received handwashing promotion and plain soap had 39% fewer days with diarrhea (95% CI, -61% to -16%) vs infants living in control neighborhoods. Severely malnourished children (weight for age z score, <-3.0) younger than 5 years living in households that received handwashing promotion and plain soap had 42% fewer days with diarrhea (95% CI, -69% to -16%) vs severely malnourished children in the control group. Similar reductions in diarrhea were observed among children living in households receiving antibacterial soap. **CONCLUSION** In a setting in which diarrhea is a leading cause of

child death, improvement in handwashing in the household reduced the incidence of diarrhea among children at high risk of death from diarrhea.

Luby, S.P., Kadir, M.A., Sharker, Y., Yeasmin, F., Unicomb, L., Islam, M.S. (2010). "A Community randomized controlled trial promoting waterless hand sanitizer and handwashing with soap, Dhaka, Bangladesh". *Tropical Medicine and International Health*. 15(12):1508-1516

*Lundahl, B., et al. (2006). "A meta-analysis of parent training: Moderators and follow-up effects." *Clinical Psychology Review* 26(1): 86-104.

A meta-analysis of 63 peer-reviewed studies evaluated the ability of parent training programmes to modify disruptive child behaviors and parental behavior and perceptions. This analysis extends previous work by directly comparing behavioral and nonbehavioral programmes, evaluating follow-up effects, isolating dependent variables expressly targeted by parent training, and examining moderators. Effects immediately following treatment for behavioral and nonbehavioral programmes were small to moderate. For nonbehavioral programmes, insufficient studies precluded examining follow-up effects. For behavioral programmes, follow-up effects were small in magnitude. Parent training was least effective for economically disadvantaged families; importantly, such families benefited significantly more from individually delivered parent training compared to group delivery. Including children in their own therapy, separate from parent training, did not enhance outcomes. (PsycINFO Database Record (c) 2010 APA, all rights reserved) (journal abstract)

*Lundahl, B. W., et al. (2008). "A meta-analysis of father involvement in parent training." *Research on Social Work Practice* 18(2): 97-106.

OBJECTIVE: Investigate (a) whether including fathers in parent training enhances outcomes and (b) whether mothers and fathers benefit equally from parent training. **METHOD:** Using traditional meta-analysis methodology, 26 studies that could answer the research questions were identified and meta-analyzed. **Results:** Studies that included fathers, compared with those that did not, reported significantly more positive changes in children's behavior and desirable parenting practices, but not in perceptions toward parenting. Compared with mothers, fathers reported fewer desirable gains from parent training. **CONCLUSIONS:** Fathers should not be excluded from parent training and should be encouraged to attend. Further research should seek to understand how parent-training programmes might better meet the needs of fathers.

Macours, K., et al. (2008). Cash transfers, behavioral changes, and cognitive development in early childhood. Evidence from a randomized experiment. Policy Research Working Paper 4759. Washington, DC, The World Bank.

*Macours, K., et al. (2012). "Cash transfers, behavioral changes, and cognitive development in early childhood: Evidence from a randomized experiment." *American Economic Journal: Applied Economics* 4(2): 247-273.

Cash transfer programmes have become extremely popular in the developing world. A large literature analyzes their effects on schooling, health and nutrition, but relatively little is known about possible impacts on child development. This paper analyzes the impact of a cash transfer programme on early childhood cognitive development. Children in households randomly assigned to receive benefits had significantly higher levels of development nine months after the programme began. There is no fade-out of programme effects two years after the programme ended. Additional random variation shows that these impacts are unlikely to result from the cash component of the programme alone.

Maluccio, J. A. and R. Flores (2004). Impact evaluation of a conditional cash transfer programme: The Nicaraguan Red de Protección Social. FCND Discussion Paper No. 184. Washington, DC, Food Consumption and Nutrition Division, International Food Policy Research Institute.

*Manaseki-Holland, S., et al. (2010). "Effects of traditional swaddling on development: A randomized controlled trial." *Pediatrics* 126(6): e1485-e1492.

OBJECTIVE: Evidence of the effects of tight, prolonged binding of infants on development is inconclusive and based on small ethnographic studies. The null hypothesis was that Mongolian infants not swaddled or swaddled tightly in a traditional setting (to >7 months of age) do not have significantly different scores for the Bayley Scales of Infant Development, Second Edition (BSID-II). **PATIENTS AND METHODS:** In a randomized controlled trial, 1279 healthy newborns in Ulaanbaatar, Mongolia, were allocated at birth to traditional swaddling or nonswaddling. The families received 7 months of home visits to collect data and monitor compliance. At 11 to 17 months of age, the BSID-II was administered to 1100 children. **RESULTS:** No significant between-group differences were found in mean scaled mental and psychomotor developmental scores. The unadjusted mean difference between the groups was -0.69 (95% confidence interval [CI]: -2.59 to 1.19) for psychomotor and -0.42 (95% CI: -1.68 to 0.84) for mental scores in favor of the swaddling group. A subgroup analysis of the compliant sample produced similar results. BSID-II-scaled psychomotor and mental scores were 99.98 (95% CI: 99.03-100.92) and 105.52 (95% CI: 104.89-106.14), respectively. Background characteristics were balanced across

the groups. CONCLUSIONS: In the Mongolian context, prolonged swaddling in the first year of life did not have any significant impact on children's early mental or psychomotor development. Additional studies in other settings need to confirm this finding. The Mongolian infants in this trial had scaled BSID-II mental and psychomotor scores comparable to United States norms.

Marsh, D. R. and D. G. Schroeder (2002). "The positive deviance approach to improve health outcomes: Experience and evidence from the field." *Food & Nutrition Bulletin* 23(4): 3-6.

Mazia, G., et al. (2009). "Integrating quality postnatal care into PMTCT in Swaziland." *Global Public Health* 4(3): 253-270.

McCartney, K., & Phillips, D.A. (Eds.) (2006). *Handbook of Early Childhood Development*. Oxford: Blackwell Publishing.

Meaney M. (2010). Epigenetics and the biological definition of gene x environment interactions. *Child Development*, 81(1), 41-79.

*Mikton, C. and A. Butchart (2009). "Child maltreatment prevention: A systematic review of reviews." *Bulletin of the World Health Organization* 87(5): 353-361.

OBJECTIVE: To synthesize recent evidence from systematic and comprehensive reviews on the effectiveness of universal and selective child maltreatment prevention interventions, evaluate the methodological quality of the reviews and outcome evaluation studies they are based on, and map the geographical distribution of the evidence. METHODS: A systematic review of reviews was conducted. The quality of the systematic reviews was evaluated with a tool for the assessment of multiple systematic reviews (AMSTAR), and the quality of the outcome evaluations was assessed using indicators of internal validity and of the construct validity of outcome measures. FINDINGS: The review focused on seven main types of interventions: home visiting, parent education, child sex abuse prevention, abusive head trauma prevention, multi-component interventions, media-based interventions, and support and mutual aid groups. Four of the seven - home-visiting, parent education, abusive head trauma prevention and multi-component interventions - show promise in preventing actual child maltreatment. Three of them - home visiting, parent education and child sexual abuse prevention - appear effective in reducing risk factors for child maltreatment, although these conclusions are tentative due to the methodological shortcomings of the reviews and outcome evaluation studies they draw on. An analysis of the geographical distribution of the evidence shows that outcome evaluations of child maltreatment prevention interventions are exceedingly rare in low- and middle-income countries

and make up only 0.6% of the total evidence base. CONCLUSION: Evidence for the effectiveness of four of the seven main types of interventions for preventing child maltreatment is promising, although it is weakened by methodological problems and paucity of outcome evaluations from low- and middle-income countries.
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*Mock, C., et al. (2003). "Injury prevention counselling to improve safety practices by parents in Mexico." *Bulletin of the World Health Organization* 81(8): 591-598.

OBJECTIVES: To evaluate the effectiveness of educational counselling Programmes aimed at increasing parents' practice of childhood safety in Monterrey, Mexico, and to provide information aimed at helping to improve the effectiveness of future efforts in this field. METHODS: Three different counselling Programmes were designed to meet the needs of the upper, middle and lower socioeconomic strata. Evaluation involved the use of baseline questionnaires on parents' existing safety-related practices for intervention and control groups and the administration of corresponding questionnaires after the Programmes had been carried out. FINDINGS: Data were obtained on 1124 children before counselling took place and on 625 after it had been given. Overall safety scores (% safe responses) increased from 54% and 65% for the lower and upper socioeconomic strata, respectively, before counselling to 62% and 73% after counselling ($P < 0.001$ for all groups). Improvements occurred both for activities that required caution and for activities that required the use of safety-related devices (e.g. helmets, car seats). However, scores for the use of such devices remained suboptimal even after counselling and there were wide discrepancies between the socioeconomic strata. The post-counselling scores for the use of safety-related devices were 55%, 38% and 19% for the upper, middle and lower socioeconomic strata, respectively. CONCLUSIONS: Brief educational interventions targeting parents' practice of childhood safety improved safe behaviors. Increased attention should be given to specific safety-related devices and to the safety of pedestrians. Educational efforts should be combined with other strategies for injury prevention, such as the use of legislation and the improvement of environmental conditions. Copyright © 2003 World Health Organization.

Mohan P., Iyengar, S.D., Martines, J., Cousens, S., Sen, K. (2004). Impact of counselling on care-seeking behavior in families with sick children: cluster randomized trial in rural India. *BMJ Publishing Group Limited*. 329(7460):266.

Moran, P., Ghate, D., and van der Merwe, A. (2004). What Works in Parenting Support? A Review of the International Evidence. Research Report RR574 20014, Policy Research Bureau.

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Oveisi, S., et al. (2010). "Primary prevention of parent-child conflict and abuse in Iranian mothers: A randomized-controlled trial." *Child abuse & neglect* 34(3): 206.

Özyazıcioğlu, N., et al. (2011). "The effect of training programmes on traditional approaches that mothers use in emergencies." *Journal of Emergency Nursing* 37(1): 79-85.

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Panter-Brick, C., Burgess, A., Eggerman, M., McAllister, F., Pruett, K., & Leckman, J. F. (in press). Recommendations for a game change in parenting interventions based on a systematic review of the global evidence. *Journal of Child Psychology and Psychiatry*.

Peairson, S., et al. (2008). "Cognitive development and home environment of rural Paraguayan infants and toddlers participating in Pastoral del Niño, an early child development programme." *Journal of Research in Childhood Education* 22(4): 343-362.

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Potterton, J., et al. (2010). "The effect of a basic home stimulation Programme on the development of young children infected with HIV." *Developmental Medicine & Child*

Neurology 52(6): 547-551.

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*Reese, E., et al. (2010). "A review of parent interventions for preschool children's language and emergent literacy." *Journal of Early Childhood Literacy* 10(1): 97-117.

It is well known that children's language development lays the foundation for their literacy development, though it is difficult for preschool teachers alone to consistently engage in the individual interactions necessary to boost children's language skills. Given that parents are their children's first teachers, it is imperative to consider how parents can help improve their children's language and emergent literacy development prior to formal schooling. This article reviews parent-training studies of children's language and literacy in three contexts: parent—child book-reading; parent—child conversations; and parent—child writing. Parent training in each of these contexts has the capacity to improve children's language and literacy, with the effects being specific to the targeted skill. All three contexts are potentially valuable sites for training parents to help their children's language and literacy. In conclusion, parents are an undertapped resource for improving children's language and literacy.

Reyes, M. R., et al. (2012). "The interaction effects of programme training, dosage, and implementation quality on targeted student outcomes for The Ruler Approach to Social and Emotional Learning." *School Psychology Review* 41(1): 82-99.

Richard, S. A., Black, R. E., & Checkley, W. (2012). "Revisiting the relationship of weight and height in early childhood." *Advances in Nutrition: An International Review Journal* 3(2): 250-254.

Richter, L. (2004). "The importance of caregiver-child interactions for the survival and healthy development of young children." A review.

*Rivera, J. A., et al. (2004). "Impact of the Mexican programme for education, health, and nutrition (PROGRESA) on rates of growth and anemia in infants and young children: A

randomized effectiveness study." *JAMA: The Journal of the American Medical Association* 291(21): 2563-2570.

CONTEXT Malnutrition causes death and impaired health in millions of children. Existing interventions are effective under controlled conditions; however, little information is available on their effectiveness in large-scale programmes. **Objective** To document the short-term nutritional impact of a large-scale, incentive-based development programme in Mexico (Progresa), which included a nutritional component. **DESIGN, SETTING, AND PARTICIPANTS:** A randomized effectiveness study of 347 communities randomly assigned to immediate incorporation to the programme in 1998 (intervention group; $n = 205$) or to incorporation in 1999 (crossover intervention group; $n = 142$). A random sample of children in those communities was surveyed at baseline and at 1 and 2 years afterward. Participants were from low-income households in poor rural communities in 6 central Mexican states. Children ($N = 650$) 12 months of age or younger ($n = 373$ intervention group; $n = 277$ crossover intervention group) were included in the analyses. **INTERVENTION** Children and pregnant and lactating women in participating households received fortified nutrition supplements, and the families received nutrition education, health care, and cash transfers. **MAIN OUTCOME MEASURES** Two-year height increments and anemia rates as measured by blood hemoglobin levels in participating children. **RESULTS** Progresa was associated with better growth in height among the poorest and younger infants. Age- and length-adjusted height was greater by 1.1 cm (26.4 cm in the intervention group vs 25.3 cm in the crossover intervention group) among infants younger than 6 months at baseline and who lived in the poorest households. After 1 year, mean hemoglobin values were higher in the intervention group (11.12 g/dL; 95% confidence interval [CI], 10.9-11.3 g/dL) than in the crossover intervention group (10.75 g/dL; 95% CI, 10.5-11.0 g/dL) who had not yet received the benefits of the intervention ($P = .01$). There were no differences in hemoglobin levels between the 2 groups at year 2 after both groups were receiving the intervention. The age-adjusted rate of anemia (hemoglobin level < 11 g/dL) in 1999 was higher in the crossover intervention group than in the intervention group (54.9% vs 44.3%; $P = .03$), whereas in 2000 the difference was not significant (23.0% vs 25.8%, respectively; $P = .40$). **CONCLUSION** Progresa, a large-scale, incentive-based development programme with a nutritional intervention, is associated with better growth and lower rates of anemia in low-income, rural infants and children in Mexico.

Rogoff, B. (2003). *The cultural nature of human development*. New York: Oxford University Press.

Roy, S. K., et al. (2005). "Intensive nutrition education with or without supplementary feeding improves the nutritional status of moderately-malnourished children in Bangladesh."

Roy, S. K., et al. (2007). "Prevention of malnutrition among young children in rural Bangladesh by a food-health-care educational intervention: A randomized, controlled trial." *Food & Nutrition Bulletin* 28(4): 375-383.

Ruel, M. T., et al. (2008). "Age-based preventive targeting of food assistance and behavior change and communication for reduction of childhood undernutrition in Haiti: A cluster randomised trial." *The Lancet* 371(9612): 588-595.

*Saleemi, M. A., et al. (2004). "Feeding Patterns, Diarrhoeal Illness and Linear Growth in 0–24-Month-old Children." *Journal of Tropical Pediatrics* 50(3): 164-169.

The aim was to study the impact of simple healthcare interventions in 0–24-month-old children living in rural communities outside Lahore, Pakistan. Newborns belonging to four birth cohorts were followed monthly from 0–24 months of age living in rural communities. Three cohorts were from the same village: Cohort A (1984–1987), n = 485; Cohort B (1990–1992), n = 544; and Cohort C (1995–1997), n = 518. A fourth, Cohort D, was from neighbouring villages (1995–1997), n = 444. Findings from Cohort A formed the basis of a healthcare Programme, including promotion of optimal breastfeeding practices, advice on oral rehydration therapy, and continued feeding during diarrhoea. The outcome measures studied were time of initiation of breastfeeding, feeding of prelacteals, exclusive breastfeeding, diarrhoeal illnesses, and postnatal linear growth. The median time of initiation of breastfeeding decreased from 47 to 3 h and exclusive breastfeeding increased from 5 per cent in Cohort A to more than 80 per cent in the subsequent cohorts, at 1 month of age. No prelacteals were given to 34 per cent of newborns in later cohorts compared with 100 per cent in Cohort A. Diarrhoeal illnesses during the first 6 months had reduced significantly. Postnatal linear growth improved by about 3 cm in the later cohorts. Appropriate changes in breastfeeding practices through integrated and focused healthcare, especially antenatally, can reduce diarrhoeal illnesses, and sustain and improve linear growth in young children.

*Santos, I., et al. (2001). "Nutrition counseling increases weight gain among Brazilian children." *The Journal of Nutrition* 131(11): 2866-2873.

To assess the impact on child growth of the nutrition-counseling component of the Integrated Management of Childhood Illnesses (IMCI) strategy, a randomized trial was implemented. All 28 government health centers in a Southern Brazil city were paired according to baseline nutritional indicators. One center from each pair was randomly selected and its doctors received 20-h training in nutrition counseling. Thirty-three doctors were included and 12–13 patients < 18 months of age from each doctor were recruited. The study included testing the knowledge of doctors,

observing consultations and visiting the children at home 8, 45 and 180 days after the initial consultation. Maternal knowledge, practices and adherence to nutritional recommendations were assessed, and anthropometric measurements were taken. Day-long dietary intake was evaluated on a subsample of children. Doctors in the intervention group had better knowledge of child nutrition and improved assessment and counseling practices. Maternal recall of recommendations was higher in the intervention than in the control group, as was satisfaction with the consultation. Reported use of recommended foods was also increased. Daily fat intake was higher in the intervention than in the control group; mean daily intakes of energy and zinc also tended to improve. Children 12 months of age or older had improved weight gain and a positive but nonsignificant improvement in length. Nutrition-counseling training improved doctors' performances, maternal practices and the diets and weight gain of children. The randomized design with blind outcome evaluation strongly supports a causal link. These results should be replicated in other settings.

Santosham, M., et al. (2010). "Progress and barriers for the control of diarrhoeal disease." *The Lancet* 376(9734): 63-67.

Sawasdipanich, N., et al. (2010). "Effects of a cognitive adjustment programme for Thai parents." *Nursing & health sciences* 12(3): 306-313.

*Schroeder, D. G., et al. (2002). "An integrated child nutrition intervention improved growth of younger, more malnourished children in northern Viet Nam." *Food and Nutrition Bulletin* 23(Supplement 2): 50-58.

Integrated nutrition programmes are widely used to prevent and/or reverse childhood malnutrition, but rarely rigorously evaluated. The impact of such a programme on the physical growth of young rural Vietnamese children was measured. We randomized six communes to receive an integrated nutrition programme implemented by Save the Children. We matched six communes to serve as controls. Our sample consisted of 238 children ($n = 119$ per group) who were 5 to 30 months old on entry. Between December 1999 and December 2000, we measured weight and height monthly for six months and again at month 12. Principle outcomes were weight-for-age Z score (WAZ), height-for-age Z score (HAZ), and weight-for-height Z score (WHZ), and the changes among these measures. As expected, anthropometric indicators relative to international references worsened as the children aged. Overall, children in the intervention communes who were exposed to the integrated nutrition programme did not show statistically significant better growth than comparison children. Intervention children who were younger (15 months or less) and more malnourished (less than -2 Z) at baseline, however, deteriorated

significantly less than their comparable counterparts. Between baseline and month four, for example, intervention children who were malnourished and less than 15 months old at entry lost on average 0.05 WAZ while similar comparison children lost 0.25 WAZ ($p = .02$). Lack of overall impact on growth may be due to a lower than expected prevalence of malnutrition at baseline and/or deworming of comparison children. Targeting nutrition interventions at very young children will have the maximum impact on growth.

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*Sripaipan, T., et al. (2002). "Effect of an integrated nutrition programme on child morbidity due to respiratory infection and diarrhea in northern Viet Nam." *Food & Nutrition Bulletin* 23(Supplement 2): 67-74.

Infectious disease and poor diet are the two proximal causes of malnutrition in children. During the 1990s, integrated nutrition programmes implemented by Save the Children (SC) in Vietnam reduced severe child malnutrition, but it has not been clear if this impact was due primarily to improved diet or reduced disease. The aim of this study was to determine whether a community-based, integrated nutrition programme in Vietnam reduced child morbidity due to diarrhea or acute respiratory infections. Children 5 to 25 months old were randomly selected from randomly assigned intervention and comparison communes. Caregivers of children from the intervention and comparison groups ($n = 119$ per group) were interviewed about their child's morbidity at programme baseline and at study months 2, 4, 6, and

12. Multiple logistic regression and general estimating equations (GEE) were used to evaluate the effect of the intervention on the occurrence of any diarrhea and respiratory illness in the preceding two weeks. Respiratory illness, mainly upper respiratory illness, was more common than diarrheal disease at baseline (54% vs. 6%, respectively). During follow-up, children in the intervention communes had approximately half the respiratory illness experienced by those in comparison communes (AOR = 0.5; $p < .001$). Diarrheal disease was also lower in the intervention group, although differences were not statistically significant. We conclude that SC's integrated nutrition programme was associated with reduced upper respiratory illness, perhaps due to improved hygiene practices and/or improved micronutrient intakes.

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We conducted a review and meta-analyses of 24 studies to evaluate and compare the outcomes of two widely disseminated parenting interventions—Parent-Child Interaction Therapy and Triple P-Positive Parenting Programme. Participants in all studies were caregivers and 3- to 12-year-old children. In general, our analyses revealed positive effects of both interventions, but effects varied depending on intervention length, components, and source of outcome data. Both interventions reduced parent-reported child behavior and parenting problems. The effect sizes for PCIT were large when outcomes of child and parent behaviors were assessed with parent-report, with the exclusion of Abbreviated PCIT, which had moderate effect sizes. All forms of Triple P had moderate to large effects when outcomes were parent-reported child behaviors and parenting, with the exception of Media Triple P, which had small effects. PCIT and an enhanced version of Triple P were associated with improvements in observed child behaviors. These findings provide information about the relative efficacy of two programmes that have received substantial funding in the USA and Australia, and findings should assist in making decisions about allocations of funding and dissemination of these parenting interventions in the future.

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*Walker, S. P., et al. (2004). "Psychosocial intervention improves the development of term low-birth-weight infants." *The Journal of Nutrition* 134(6): 1417-1423.

It is estimated that 11% of births in developing countries are term low-birth-weight (LBW); however, there is limited information on the development of these infants. Our objectives were to determine the effect of psychosocial intervention on the development of LBW infants and to compare term LBW and normal-birth-weight (NBW) infants. Term LBW (n = 140) and NBW infants (n = 94) were enrolled from the main maternity hospital in Kingston, Jamaica. The LBW infants were randomly

assigned to control or intervention comprising weekly home visits from birth to 8 wk and from 7 to 24 mo of age. Development was assessed at 15 and 24 mo with the Griffiths Scales. The intervention benefited the infants' developmental quotient (DQ, $P < 0.05$) and performance subscale at 15 mo ($P < 0.02$), the hand and eye ($P <$

0.05) and performance subscales ($P < 0.02$) at 24 mo, and home environment at 12 mo. The effect of the intervention on development was mediated in part by the improvement in the home environment. The control LBW infants had significantly lower scores than the NBW in DQ and several subscales, whereas there were no significant differences between the NBW and the LBW infants after intervention. In conclusion, term LBW was associated with developmental delays, which were reduced with psychosocial intervention.

Walker, S. P., et al. (2005). "Effects of early childhood psychosocial stimulation and nutritional supplementation on cognition and education in growth-stunted Jamaican children: Prospective cohort study." *The Lancet* 366(9499): 1804-1807.

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*Watanabe, K., et al. (2005). "Early childhood development interventions and cognitive development of young children in rural Vietnam." *The Journal of Nutrition* 135(8): 1918-1925.

Little is known about the long-term benefits of interventions that aim to promote early childhood development programmes. The goal of this research was to determine whether an early childhood development intervention added to a nutrition intervention during preschool ages had lasting effects on the cognitive development of school-age children in communes of Thanh Hoa province in rural Vietnam. The study focused on a total of 313 children aged 6.5–8.5 y (grades 1 and 2 in primary school) in 2 communes that were exposed to nutrition intervention or nutrition and early childhood development (ECD) intervention from 1999 to 2003. Measurements of height and cognitive test scores (Raven's Progressive Matrices Test) were collected from the children; household characteristics were determined by interviews with mothers. Longitudinal analysis was performed by integrating the data with that collected from the same children in past surveys. Significant effects of the ECD intervention compared with the nutrition intervention were detected. The beneficial effect of ECD intervention on the cognitive test scores was large for the most nutritionally challenged children whose height-for-age Z-scores declined

or remained in the stunted range. The findings help provide useful insights into the

development of an effective integrated model of ECD and nutrition intervention for children in rural Vietnam.

*Waters, H. R., et al. (2006). "The cost-effectiveness of a child nutrition education Programme in Peru." *Health Policy and Planning* 21(4): 257-264.

This article reports impact and cost results from a health facility-based nutrition education Programme targeting children less than 2 years of age in Trujillo, Peru. Key elements of the Programme included participative complementary feeding demonstrations, growth monitoring sessions and an accreditation process. Data were collected from six intervention and six control health facilities to measure utilization and costs associated with the intervention. To calculate the unit costs of services, these costs are allocated using activity-based costing. To measure the effects of the intervention, 338 children were followed through household surveys at regular intervals from birth until the age of 18 months. The intervention had a clear positive impact both on the use of nutrition-related services and on children's growth outcomes. Children in the intervention areas made 17.6 visits to health facilities in the first 18 months of life, compared with 14.1 visits for children in the control areas ($P < 0.001$). This pattern holds true for all socioeconomic groups. The intervention prevented 11.1 cases of stunting per 100 children. In multivariate logistic regression analysis, children in the intervention were 0.33 times as likely to be stunted as the controls ($P = 0.002$). The marginal cost of the intervention – including external costs, training, health education materials and extra travel and equipment – is US\$6.12 per child reached and US\$55.16 per case of stunting prevented. The estimated marginal cost of the intervention per death averted is US\$1952.

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