Faculty of Education
The University of Hong Kong

Comparative Education Research Centre

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Early childhood development and cognitive development in developing countries

EVIDENCE BRIEF

Early childhood interventions have a reliable and positive effect on cognitive development

About this brief

This paper summarises findings from a rigorous literature review entitled *Early childhood development and cognitive development in developing countries* (Rao et al. 2013)*. It was led by the Comparative Education Research Centre at The University of Hong Kong, and funded by the Department for International Development's (DFID) Research and Evidence Division.

The review assembled evidence to determine how, why and under what conditions Early Childhood Development (ECD) interventions are effective in promoting cognitive development of children living in low- and middle-income countries (LMICs). ECD interventions include (i) programmes for children under three years and their families;(ii) informal and formal services for children ranging from three to six years, which aim to prepare the child for formal primary education; and (iii) support for children in the early grades of primary school.

The studies were grouped by intervention: parent-focused, child-focused, nutrition and health interventions and income-supplementation programmes. The body of evidence also includes comprehensive programmes that provide a mix of different services (for example, parental support, preschool education and healthcare services).

How to use this brief

This brief provides an overview of key evidence to assist policy-makers and researchers in assessing the research in this field. Policy-makers should, of course, carefully consider their own specific context.

Methodology

Relevant keywords (*early childhood development* and *cognitive development*) were used to search for evidence in nine electronic databases, reference lists of journals, and specialist websites. Only studies published after 1992 were considered. Following a rigorous screening procedure, 111 studies conducted in 40 developing countries were selected for inclusion. These 111 studies were coded to specify their methodological rigour and consistency. Findings from 70 of these 111 studies were statistically combined using meta-analyses. In addition, narrative summaries of 14 were prepared to help identify key messages from different studies.

Key findings

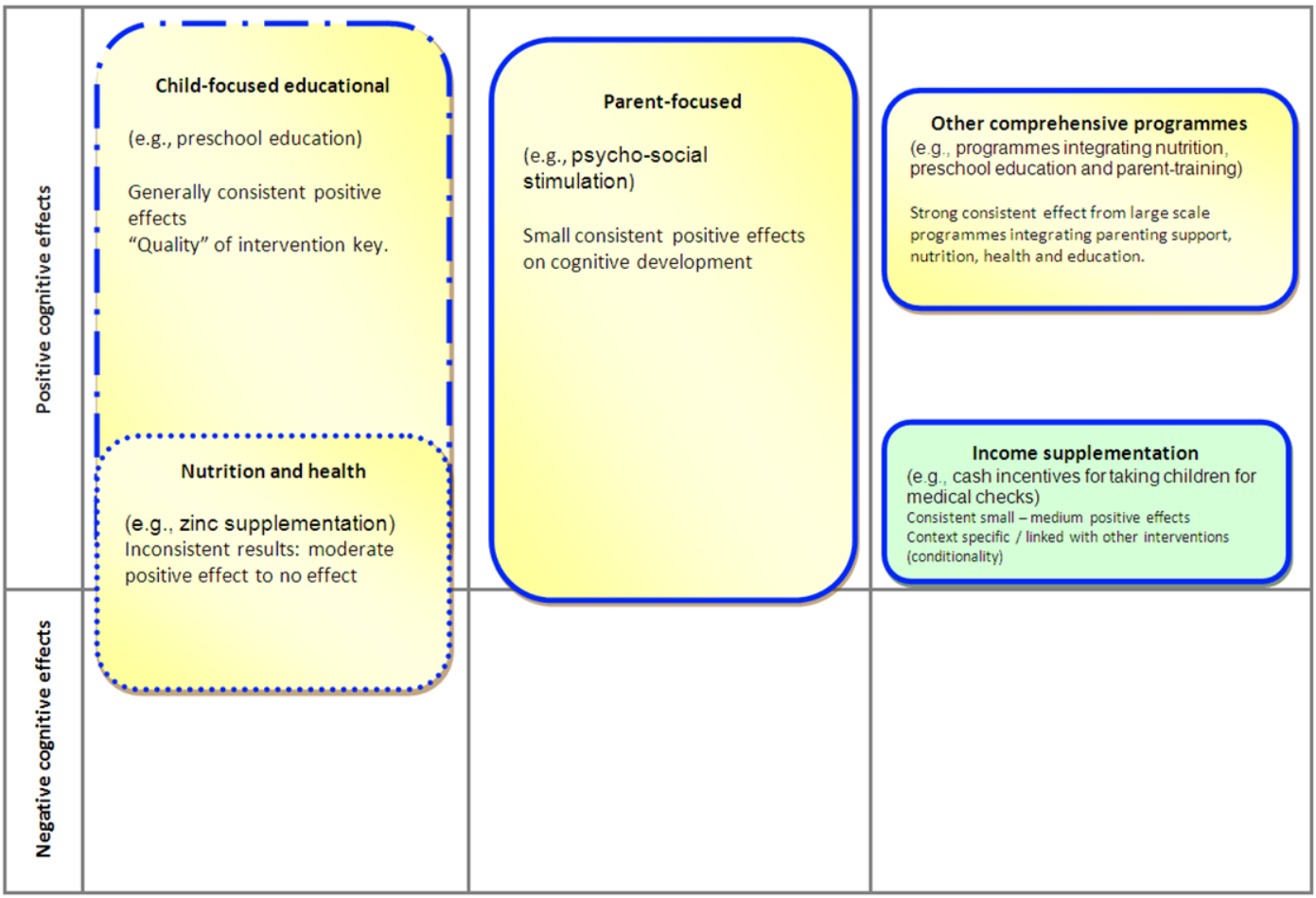
- A large, high-quality evidence base shows ECD interventions focusing on (i) parental support; (ii) early stimulation and education; (iii) nutrition and health; (iv) income supplementation; and (v) comprehensive and integrated programmes have positive effects on children's cognitive development.
- The largest effects are associated with comprehensive programmes.
- Parent-focused interventions are most effective when both the child and parent are involved.
- Using well-qualified early childhood educators and community health workers led to better cognitive outcomes for children across programmes.

Research gaps

There is limited evidence on both cost effectiveness and long-term effects of interventions. Only 38 of the 70 studies considered the effects of an intervention six months after completion. Further, studies did not reflect the population distributions of children in developing countries. Most of the studies were conducted in Latin America and the Caribbean (38%) and in South Asia (28%).

Summary map of evidence

The figure below is based on 70 studies (115 interventions) in 30 developing countries that reported the necessary information for effect-size calculation. One study could have more than one intervention group and intervention was used as the unit of analysis. Further detail on effect size by intervention is included in the main report. The height of the textboxes in the figure represents the range of effect sizes for each type of intervention.



Notes on context

1. **Nutrition and health** interventions were most common in Asia, although interventions were also identified in Africa and Latin America and the Caribbean.
2. **Child-focused educational** interventions were most common in Asia and Africa and the majority of them involved early education programmes for children over three years of age.
3. **Parent-focused interventions** were implemented in different parts of the world. Change agents were usually professional or paraprofessional community health workers who worked with parents and children together.
4. Other **comprehensive programmes** were implemented in Asia and Latin America. These programmes typically included parenting education, preschool education and nutrition interventions.
5. **Income supplementations** were found exclusively in Latin America and the Caribbean. The effects of both stand-alone and integrated cash-transfer programmes were evaluated and the findings from different interventions were consistent with one another.

Outline of evidence

Parent-focused interventions

Characteristics of effective interventions	Factors unrelated to intervention effectiveness
✓ **Include guided practice for parents** ✓ **Involve both parents and children** ✓ **Provide opportunities for sharing and group discussion** ✓ **Include at least two contacts between parents and change agents** ✓ **Have regular monitoring of implementation** ✓ **Use culturally appropriate materials**	• Parent-alone programmes • Programmes for children above three years that last for less than two years

Taken together, parent-focused interventions generally produced small positive effects on cognitive development. Interventions that included both parent and child and focused on parenting skills commonly had larger positive effects than did parent-only programmes or information-based interventions. Short-term interventions were effective for children under 18 months, but interventions that lasted at least two years had sustainable positive effects on older children. Almost all of the parenting interventions focused on teaching parents to promote child development through play, often utilising homemade toys or other readily available household items. All interventions had key messages or defined curricula. Parent-focused interventions led to beneficial changes in parents, positively influencing parent-child relationships and the general atmosphere of the home. These may have helped support continuous cognitive development beyond the intervention period.

Child-focused educational interventions

Characteristics of effective interventions	Factors unrelated to intervention effectiveness
✓ **High-quality programme with qualified and trained early childhood educators** ✓ **Some degree of structure** ✓ **Child-appropriate curriculum**	• Mere participation in a programme (as quality of stimulation was important) • Location of the intervention • Age of the child

Child-focused educational interventions produced generally consistent positive effects on children's cognitive development. The majority of these interventions for children over three years were implemented in preschools or child-care centres. The duration of interventions ranged from one month to several years. There was a positive relationship between the quality of educational interventions and child outcomes. High-quality programmes had well-qualified and properly trained educators. They also had a moderate degree of structure and child-appropriate curricula and instruction.

Nutrition and health interventions

Characteristics of effective interventions	Factors unrelated to intervention effectiveness
✓ **The capacity to plan, manage, deliver and monitor interventions** ✓ **Prenatal and post-partum micro-nutrient (MM) supplement** ✓ **MM-fortified food until two years (versus MM alone)** ✓ **MM-fortified biscuits and milk**	• Type of supplement provided • Duration of intervention • Number of contacts • Location of intervention • Guidance and training of change agents

The results from 20 nutrition and health studies examined together showed that these interventions as a whole had smaller effects on cognitive development than other interventions. However, it is important to emphasise that children not only benefited directly from the health effects of nutritional supplements, but also showed significant cognitive gains within the short assessment periods. The level of effect sizes did not vary based on the type of supplementary

nutrition components provided. In general, the frequency, duration and location of interventions, as well as the characteristics and training of change agents (usually community health workers) were not clearly related to the effect size. The factors determining programme success were often dependent on capacity to plan, manage, deliver and monitor these services. Our findings of the small effect of nutrition on cognitive development may be due to the use of less sensitive tools for measuring cognitive development and because the interrelationships between socioeconomic circumstances, nutrition and cognitive development make it difficult to isolate the specific effects of malnutrition on cognitive development.

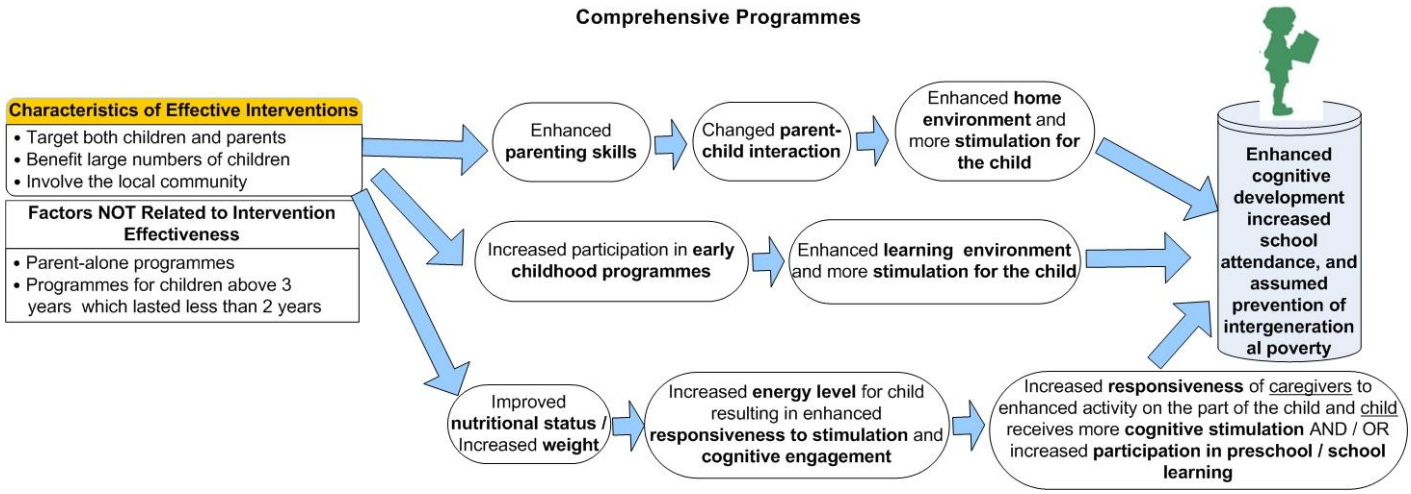
Income supplementation

Characteristics of effective interventions	Factors unrelated to intervention effectiveness
✓ **Target the most disadvantaged** ✓ **Earlier enrolment** ✓ **Longer duration**	• Parent-alone programmes • Short duration for children above three years

Income-supplementation programmes had small-to-medium-sized positive effects on cognitive development. In the interventions studied, the family (usually the mother) only received the benefits for compliance with certain requirements. The exact reason why income-supplementation programmes, particularly conditional cash-transfer programmes (CTPs), work is hard to pinpoint because the conditions they are associated with are often themselves interventions (medical checks, parental counselling or programme attendance). However, available studies do seem to suggest that earlier enrolment and longer duration of exposure produce larger positive effects in young children.

Other comprehensive programmes

Evaluations of large-scale comprehensive programmes indicate that children in LMICs benefit from comprehensive early-intervention programmes that typically integrate parenting support, nutrition and healthcare services and education. The programmes reviewed demonstrated some overarching similarities: (i) they all targeted children and parents in low-income families, (ii) they aimed to benefit large numbers of children, (iii) they included a mix of different services and children from a range of ages, and (iv) most of the interventions fostered community involvement, encouraging the beneficiaries of the programme to become agents of change themselves. The diagram below shows how parent-focused, child-focused educational, and nutrition and health interventions can enhance cognitive development, and is suggested by the synthesis of quantitative findings from large-scale interventions that evaluated comprehensive programmes.



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List of 70 studies included in the meta-analyses. The rigorous literature review included 111 studies.

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