Overview

• The effect of nutrition interventions on child development.

• The effect of stimulation interventions on child development.

• Evidence-based design and implementation for nutrition and stimulation interventions in the first 2000 days of life.
How Nutritional Status Might Affect Development

Prado & Dewey, Nutrition Reviews, 2014
Prenatal Nutrition Interventions and Cognitive Development

Impact: Cohen’s $d$ 0.042 (95% CI -0.0084, 0.092)
## Postnatal Nutrition Interventions and Cognitive Development

**Impact:**

**Overall:** Cohen’s $d$ 0.076 (95% CI 0.019, 0.13)

**Macronutrients:** Cohen’s $d$ 0.14 (95% CI 0.067, 0.27)

**MMN:** Cohen’s $d$ 0.082 (95% CI -0.012, 0.18)

**Single Nutrients:** Cohen’s $d$ 0.058 (95% CI -0.0015, 0.12)
Advancing the Evidence on Nutrition Interventions and the Promotion of Early Child Development

• Improving Outcomes:
  • Longer intervention duration
  • Improved targeting of context specific nutrition risks
  • Improved study of behaviour change techniques that support strengthening of parenting (feeding) skills and nutritional practices.

• Knowledge Gaps:
  • Interventions to reduce risks of over nutrition and early child development outcomes.
  • Role of nutrition interventions in supporting early motor and social-emotional development
Overview

• The effect of nutrition interventions on child development.

• The effect of stimulation interventions on child development.

• Evidence-based design and implementation for nutrition and stimulation interventions in the first 2000 days of life.
How Stimulation Might Affect Mental Development

Provision of stimulation
- Play materials
- Child-directed talk

Child Engagement
- Active exploration and problem solving
- Communication
- Brain development

Mental Development
- Cognitive
- Sensory-motor
- Language

Lack of Stimulation

- 10-41% of households in LAMIC provided stimulation materials.
- 11-33% of parents involved in play with children.

Data Source: UNICEF MICS

Photo Credit: Professor S Walker
Stimulation Interventions and Cognitive Development

Impact: Cohen’s $d$ 0.42 (95% CI 0.36, 0.48)

<table>
<thead>
<tr>
<th>Study</th>
<th>% Weight</th>
<th>Effect Size and 95% CI</th>
<th>Country</th>
<th>Intervention</th>
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<tr>
<td>Eickmann et al. 2003</td>
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<td>[0.36, 0.42]</td>
<td>Brazil</td>
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<td>Gardner et al. 2003</td>
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<td>Powell et al. 2004</td>
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<td>Nahar et al. 2009</td>
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<td>Aboud et al. 2013</td>
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<td>Overall Effect Size</td>
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Aboud & Yousafzai, Annual Review of Psychology, 2015
Stimulation Interventions and Language Development

Impact: Cohen’s $d$ 0.47 (95% CI 0.37, 0.56)

Aboud & Yousafzai, Annual Review of Psychology, 2015
Stimulation Intervention Features Associated with Successful Outcomes

- Implementation of a structured curriculum
- Coaching and feedback to strengthen responsive and positive parenting interactions.
- Application of several behaviour change techniques
- Clear defined theory of change
- Inclusion of problem solving during the contact time with parents.
Advancing the Evidence on Stimulation Interventions and the Promotion of Early Child Development

- Improving Outcomes:
  - Improved analysis of process pathways (family care processes)
  - Analysis of delivery processes (group/individual, intensity)

- Knowledge Gaps:
  - Diverse settings- majority of studies on early stimulation in the last 10 years are from South Asia.
  - Role of stimulation interventions in supporting early social-emotional development under studied.
Overview

- The effect of nutrition interventions on child development.
- The effect of stimulation interventions on child development.
- Evidence-based design and implementation for nutrition and stimulation interventions in the first 2000 days of life.
The Jamaica Study

Grantham-McGregor et al., Lancet, 1991
What Do We Know About Integrated Nutrition and Stimulation Interventions?

- Nutrition interventions promote early child growth and feeding practices.
- Stimulation (responsive care) interventions support feeding practices.
- Nutrition interventions have small impacts on child cognitive development, while stimulation interventions have moderate impacts on cognitive development.
- Some evidence to show additive benefits (primarily work from Jamaica), but few studies designed to test the independent and additive benefits of interventions.
- No evidence of harm as a result of combining interventions.
- Limited evidence on integration of stimulation with nutrition on children with SAM
- Limited evidence on longitudinal impacts of either intervention on developmental trajectories.
Potential Benefits of Integrated Nutrition and Stimulation Interventions

- Mitigate common risks (e.g., sub-optimal care practices)
- Impact multiple child outcomes (growth, health, development)
- Programme efficiencies if using a common delivery platform.
- Common window of opportunity in the life course to begin interventions:
  - Nutrition- preconception through 1000 days
  - Stimulation- continue through to first 2000 days
## Integrated Design and Implementation

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
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<tbody>
<tr>
<td><strong>Timing</strong></td>
<td>• Organize messages guided by neuro, nutrition &amp; developmental sciences (1000 days +)</td>
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<tr>
<td><strong>Intensity</strong></td>
<td>• Boosters for less intense/shorter programmes</td>
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<tr>
<td><strong>Content</strong></td>
<td>• Structured curriculum</td>
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<tr>
<td></td>
<td>• Concrete messages (#8-10)</td>
</tr>
<tr>
<td></td>
<td>• Adequate food + education</td>
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<tr>
<td><strong>Training &amp; Supervision</strong></td>
<td>• Competency based training</td>
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<tr>
<td></td>
<td>• Supportive supervision and feedback loops</td>
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</table>
Integrated Delivery Approaches

**Home**
- Min fortnightly
- 20-60 minutes
- Tailored to individual child and family
- Good compliance

**Groups**
- Weekly-monthly (short intense or less intense & longer duration
- 1-2hrs for 8-25 caregivers
- Social support, positive attitudinal change, peer learning

**Clinics**
- Value – visible in health service
- Shorter term outcomes (Knowledge-practice)
Strengthening Family Capacity to Improve Child Nutrition and Development Outcomes

- Conditional cash transfers have significant indirect benefits to participation in prenatal services, growth monitoring, uptake of micronutrients (Britto et al., Lancet, 2016).

- Need to explore:

  1. Conditions linked to specific parenting and stimulation strengthening opportunities in the first 3 years of life.

  2. Multi-sector coordination opportunities to link poverty alleviation and early parenting programmes.
Maternal Depression

Prevalence

• 15.6% antenatal in LAMIC (10% in high income countries)

• 19.8% post partum in LAMIC (13% in high income countries)

Fisher et al., Bulletin WHO, 2012

Consequences

• Low weight-for age.

• Increased episodes of diarrheal illness.

• Lower ‘responsive’ stimulation and child rearing.

Walker et al., Lancet, 2011
Conclusions

• Nutrition intervention alone is inadequate to promote optimal child development.

• Integration of stimulation, with attention to parenting skills and capacities, with nutrition intervention has potential benefits.

• Research:
  • Focus on implementation features and processes that moderate multiple child outcomes (growth health, cognition, behaviour).
  • Focus on life course to determine best mix and intensity of messages over the first 2000 days.