Implementation Research and Practice for Early Childhood Development

Effective ECD Interventions

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The road to equity needs to be paved with more than good intentions.
How can we keep populations of children healthy and developing well?
How do we go beyond good intentions?
What do we know?
“The evidence is now clear that the way humans develop is a result of the interaction between a variety of genetic, epigenetic, and environmental factors that operate as an integrated system.

We are not predetermined by any single factor; but rather from a mix of what we inherit and the contexts in which our development takes place. What we do matters.”
Once a child falls behind, he or she is likely to remain behind.

.... Impoverished early environments are powerful predictors of adult failure on a number of social and economic dimensions.’

(James Heckman, 2006)
Early adversity

‘Biological embedding of environmental events’ (Hertzmann)
Impact of adversity early in life

Box 1 | The role of neuroscience in addressing socioeconomic status-related disparities

Proportionate universalism

Focusing solely on the most disadvantaged will not reduce health inequalities sufficiently.

To reduce the steepness of the social gradient in health, actions must be universal, but with a scale and intensity that is proportionate to the level of disadvantage.

We call this proportionate universalism.
For families living in adversity it may be that the mutual benefit of both continuity and complementarity of services will be necessary to promote human capital.

I'm sure glad the hole isn't in our end...
A data driven and evidence based approach to understanding and addressing inequities: enabling system reform

- Innovation: Using improvement for change
- Implementation: Indicators to drive change
- Implementation: Relational practice
- Implementation: Stacking existing evidence based services, programs and strategies
Can an Australian model of sustained nurse home visiting delivered within existing services make a difference to child development and family wellbeing?
right@home

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A research collaboration between the Australian Research Alliance for Children and Youth (ARACY), the Translational Research and Social Innovation (TReSI) group at Western Sydney University, and the Centre for Community Child Health (CCCH)
The right@home model

An anticipatory, aspirational, preventive, sustained and (flexibly) structured model of embedded service delivery

• Core program - Maternal Early Childhood Sustained Home-visiting (MECSH)
• Additional modules focusing on: sleep, safety, nutrition, regulation, bonding/relationship
• 25-35 visits – from pregnancy until 2yrs
• Structured flexibility
• Grounded in a partnership approach
• Focus on building capacity
• Embedded in existing service systems
• Program and process training and implementation support by TReSI

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Research hypothesis

Primary hypothesis: At child age 2 years, compared with usual care, women receiving the right@home sustained nurse home visiting intervention will demonstrate:

1. **Improved parent care**
   Parent’s ability to provide a consistent and regular environment for their child

2. **Improved parent responsivity**
   Parent’s ability to tune in to their child’s needs and to respond appropriately

3. **A more supportive home learning environment**
   Building a strong home learning environment through structured developmental promotion activities focusing on language

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Three to five year follow up aims

Intervention mothers will demonstrate improved:
• Parenting
• Health
• Wellbeing

Intervention children will demonstrate improved:
• Physical health
• Mental health
• Learning and language

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Primary outcomes at 2 years of age

- Parent care
- Parent responsivity
- Home learning environment
Nurse Home Visiting for Families Experiencing Adversity: A Randomized Trial

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OBJECTIVES: Nurse home visiting (NHV) may redress inequities in children’s health and development evident by school entry. We tested the effectiveness of an Australian NHV program (right@home), offered to pregnant women experiencing adversity, hypothesizing improvements in (1) parent care, (2) responsivity, and (3) the home learning environment at child age 2 years.

METHODS: A randomized controlled trial of NHV delivered via universal child and family health services was conducted. Pregnant women experiencing adversity (>2 of 10 risk factors) with sufficient English proficiency were recruited from antenatal clinics at 10 hospitals across 2 states. The intervention comprised 25 nurse visits to child age 2 years. Researchers blinded to randomization assessed 13 primary outcomes, including Home Observation of the Environment (HOME) Inventory (6 subscales) and 25 secondary outcomes.

RESULTS: Of 1427 eligible women, 722 (50.6%) were randomly assigned; 306 of 363 (84%) women in the intervention and 290 of 359 (81%) women in the control group provided 2-year data. Compared with women in the control group, those in the intervention reported more regular child bedtimes (adjusted odds ratio 1.76; 95% confidence interval [CI] 1.25 to 2.48), increased safety (adjusted mean difference [AMD] 0.23; 95% CI 0.07 to 0.37), increased warm parenting (AMD 0.09; 95% CI 0.02 to 0.16), less hostile parenting (reverse scored; AMD 0.29; 95% CI 0.16 to 0.41), increased HOME parental involvement (AMD 0.26; 95% CI 0.14 to 0.38), and increased HOME variety in experience (AMD 0.20; 95% CI 0.07 to 0.34).

CONCLUSIONS: The right@home program improved parenting and home environment determinants of children’s health and development. With replicability possible at scale, it could be integrated into Australian child and family health services or trialed in countries with similar child health services.
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3 Year Outcomes - Mother

Adjusted* Effect Sizes/Odds Ratios with 95% CI for maternal outcomes at 3 years (MULTIPLE IMPUTATION - ITT)

Parent mental health and wellbeing
3 Year Outcomes - Child

Adjusted* Effect Sizes/Odds Ratios with 95%CI for child outcomes at 3 years
(MULTIPLE IMPUTATION - ITT)

* Baby gender; Mother’s age at Baseline; SEIFA Disadvantage score at Baseline; Maternal education at Baseline; Parity; Antenatal risk; Mental health; Self efficacy; Child age at 3 Year Au.

CHILD LANGUAGE
- CELF Sentence Structure
- CELF Word Structure
- CELF Expressive Vocabulary
- CELF Core Language

CHILD HEALTH
- SDQ - Total externalising (reverse)
- SDQ - Total internalising (reverse)
- SDQ - Total behaviour problems (reverse)
- PedsQL - Physical wellbeing
- PedsQL - Socioemotional wellbeing

CHILD HEALTH
- No dental caries
- Not overweight or obese
Process and impact outcomes

- 84% of women received >75% of the intervention (mean 23.5)

- >80% of women were retained in the program for the full 2 years

- Parent satisfaction questionnaire (ES 0.9) and enablement index favour the intervention (ES 0.55)
Scaling for impact: the challenge of fidelity and adaptation
Australian Sites

Darwin, Northern Territory
Brisbane, Queensland
Melbourne, Victoria
Victorian Sites
Queensland Sites

Beaudesert
Logan
Scaling up with fidelity:

1. Retention
2. Dose
3. Relationship with practitioner
4. Program content

These need to be monitored: meso metrics
Could these be global tools?
What about adaptation?
“Off the shelf” versus embedded, adapted programs

Spread: Taking a new intervention and replicating it at other sites

Scale-up: Overcoming the system & infrastructure issues that arise during implementation and spread of changes for results at the system level

Kemp L (2016) Adaptation and fidelity: a recipe analogy for achieving both in population scale implementation. Prevention Science 17(4), 429-438
8. Add remainder of cake mixture, spreading with knife dipped in hot water if necessary.
9. Bake in a moderate oven, 180–190°C, for 20 to 30 minutes.
10. When cool, cover with warm icing flavoured with lemon juice.
11. Sprinkle with cinnamon.

**BASIC PLAIN CAKE**

**INGREDIENTS**

- 1⁄2 cup margarine or butter
- 2 eggs
- 1⁄2 cup sugar
- 2 cups self-raising flour
- 4 drops vanilla essence
- 1⁄2 cup milk

**METHOD**

1. Grease and lightly flour desired pan (see step 5 below).
2. Cream margarine, sugar, and vanilla.
3. Beat eggs and add gradually, beating well after each addition. If using an electric mixer use unbeaten eggs, one at a time, and mix each one in on speed 8.
4. Add sifted flour alternately with the milk, beginning and ending with flour. Beat 1 minute on speed 4 of electric mixer, or 30 strokes with a wooden spoon.
5. Spread in prepared pan. This quantity fills:
   a. two 18 cm shallow cake pans
   b. one 25 × 15 × 6 cm loaf cake pan
   c. two 25 × 9 × 5 cm bar cake pans
   d. one 18 × 7 cm deep cake pan
   e. one 20 × 18 × 4 cm slab cake pan
   f. one 20 × 7 cm ring pan
6. Cook on centre shelf in a moderate oven, 180–190°C. (a), (c), (e) and (f) 30 to 35 minutes; (b), (d) and (e) 40 to 45 minutes.
7. Test if cooked by inserting a clean thin skewer lightly into the centre of the cake. If it comes out free from mixture, the cake is cooked.
8. Stand pan on cake cooler 5 to 10 minutes before turning cake out. Cool.
9. Finish as desired.

**CHEESE CAKES**

**INGREDIENTS**

- 1 quantity shortcrust pastry (see p. 133)
- Jam
- 1 quantity plain cake mixture (see opposite)
Variations

• Incorporate local programs and interventions
• Use local materials, practices and policies
• Respond to/incorporate local concerns
• Work within local community, professional and service system requirements and capacities
• Both program and context variation
How to spread/scale-up decision-making tool
(https://s3.amazonaws.com/billionsinstitute/ways_there.html)
Choosing the ‘right’ processes for scaling
(see https://ssir.org/articles/entry/many_ways_to_many)

MECSH approached: Licenced program

- Defining ‘site’
- Adaptation to local context
- Local ownership for sustainability
- Training, clinical support, quality monitoring
- Community of practice/network
- Securing/building qualified Extension Agents
### Basic Plain MECSH ‘Cake’

**INGREDIENTS**
- Sustained structured nurse home visiting (minimum 25 visits to schedule antenatal to child age 2)
- Supporting mother and child health and wellbeing
- Supporting mothers to be future oriented and aspirational
- Child development parent education program (comprehensive and structured)
- Supporting family and social relationships
- Trained postgraduate nursing workforce
- Embedded in universal primary, secondary and tertiary child and family health service (including social care practitioner in program team)

**METHOD**
- Home visiting: scheduled timing and quantity
- Partnership between the nurse and the family
- Group activities
- In-reach (resources drawn into the program to support families and practitioners) and out-reach (referral) processes

**EQUIPMENT**
- Practitioner and service capacity to identify and respond to families with remediable risk in the population – where and when needed
- Effective staff training and supervision systems
- Effective management and leadership
- Access to resources to support families and practitioners
- Tiered, ecological and multidisciplinary approach to support family, practitioner and service capacity building
- Proportionate universal approach with service for vulnerable families embedded within the broader universal service system
- Data tools and system for fidelity and quality monitoring
MECSH-based programs utilise a range of focus modules to support addressing of local priorities.

Appropriate content is:
• evidence-based,
• consistent with the MECSH delivery model, and
• underpinning theories.

Local resources are incorporated into the modules.

Outcome measures appropriate to the focus modules should be included in program monitoring.
Core MECSH (basic recipe) plus

right@home Victoria/Brisbane

• Parent care of the child
  • Nutrition and growth
  • Sleep and settling
  • Household safety
• Promoting parent attunement and responsivity
  • Promoting First Relationships
  • Video-feedback (compulsory MECSH module)
• Developmentally supportive home environment
  • Learning to Communicate (compulsory MECSH module)
  • SmallTalk

MECSH Northern Territory

• Extend program to child age 3 years for continuity with early years education
• Parent care of the child
  • Skin health and hygiene
• Promoting parent attunement and responsivity
  • Promoting First Relationships
  • Video-feedback (compulsory MECSH module)
• Developmentally supportive home environment
  • Learning to Communicate (compulsory MECSH module)
• Maternal/family wellbeing
  • Antenatal smoking cessation
  • Family violence
"I think you should be more explicit here in Step Two."
MECSH program fidelity requirements

- Are all eligible families being identified and offered the program?
- Are most eligible families taking up the offer to participate in the program?
- Are most eligible families taking up the offer antenatally?
- Are the program staff provided with the capacity (training, supervision, resources, multidisciplinary support) to deliver the program including any adaptations?
- Are participating families fully engaging in the program?
- Is the program being delivered in accordance with the program protocol (both the core program and adaptations)?
- Is the program being delivered with quality?
- Is the Child Development Parent Education program being delivered with quality in accordance with the program protocol?
- Are other resources and tools to support families being delivered with quality (including all identified aspects of any adaptations)?
What next? Make bold decisions
Many things we need can wait, the child cannot. Now is the time his bones are being formed, his blood is being made, his mind is being developed. To him we cannot say tomorrow, his name is today.

Gabriela Mistral
(1889-1957)