Positive eating behaviours and obesity prevention – results of the NOURISH RCT

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NOURISH

• **Aim:** evaluate early feeding intervention for first-time mothers - commencing infants 4-6 m.

• **Overall RQ:** Can early *anticipatory guidance* increase ‘protective’ feeding practices that support development of healthy child eating behaviours, intake and growth?
Why target early feeding practices?

- Feeding practices in early childhood fall well short of ideal (Chan 2010)
  - ↑ exposure non-core; ↓ fruit & veg even <2y (Chan 2010)
    - Coercive feeding practices; emotional use food prevalent
- Feeding practices influenced culture & tradition - evolved in time of relative food scarcity (Birch, 2006)
  - Need new approaches adapted to contemporary ‘obesogenic’ food environment
  - Start early to
    - Program taste & texture preferences
    - Preserve capacity to self regulate intake
    - Develop good rather than change bad habits
Participants

• First-time mothers of healthy term infants
• Recruited major maternity hospitals (Adelaide and Brisbane; 2008-2009): consecutive sample
• Allocated 698 - 44% consent rate (excl non-contacts)
  – Individual randomisation, stratified by clinic (≈ SES)
• Mothers
  – Older (30 vs 27y); better educated (58 vs 32% tertiary education) than non-consenters
• Retention at T5 (5 years) was 61%
Allocation

Intervention

• Setting – child health clinics Adelaide and Brisbane

• 2 parent education modules
  – 4-7m – transition to solids - ‘learning to like, liking to eat’
  – 13-16m – increased autonomy - ‘parent provide, child decide’

• 6 f/n 1.5h group sessions – dietitian and psychologist

• 6 x monthly maintenance email/text between modules

Control

• Self directed access to community child health service – limited
  – Telephone advice service, individual measure clinics
NOURISH program – content & process

• Feeding relationship, process, skills - ‘what and how’
• Feeding practices
  – Positive exposure
  – Responsive feeding
• Authoritative parenting; maternal sensitivity (attachment)
• Healthy growth; nutrition requirements; developmental stage
• Peer learning – interactive sessions
• Cognitive behavioural approach – role plays, goal setting,
• Building supportive environments – discussion
environmental barriers; information packs for other carers
Program messages

• The way we feed young children affects the food they will like and their health
  – ‘Learning to like, liking to eat’

• Listen to and trust your child
  – ‘Parent provide, child decide’ (Satter)

• Habits are formed early and track to adulthood

• Set good examples for your child

• Your relationship with your child is important
Program messages (2)

Manage exposure

• Understand & expect neophobia
  – Anticipatory guidance

• Repeated neutral exposure ≥ 10 times

• Neutral limited exposure to non-core foods – covert restriction
  – Role modelling
  – Availability through structured choice
Program messages (3)

Self regulation: ‘Parent provide child decide’

- Listen to and trust your child
- Parents: meal content and interval
- Child: meal size
  - guidance re portion size, normal growth patterns
  - don’t focus on amounts, but trusting satiety cues
- General food refusal = satiety
  - no alternatives
  - no rewards/bribes
  - no games/distractions (NO TV!)
  - no pressure
Program messages (4)

• Encourage autonomy – self feeding
  – Developmental stage
  – Accept mess

• No emotional feeding – distract, sad, well behaved

• Avoid praise for eating
Outcomes

Child
- Eating behaviour
- Measured weight & length
- Food intake (24h recall); preferences (listed items)

Maternal
- Feeding practices & styles
- Strategies to manage neophobia and general food refusal
- Parenting skills and efficacy
Baseline results (N=698)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean (SD) or % (count)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mother</strong></td>
<td></td>
</tr>
<tr>
<td>Age at delivery (years)</td>
<td>30 (5)</td>
</tr>
<tr>
<td>University education</td>
<td>58 (406)</td>
</tr>
<tr>
<td>BMI (at baseline)</td>
<td>26 (5.3)</td>
</tr>
<tr>
<td><strong>Child</strong></td>
<td></td>
</tr>
<tr>
<td>Gender (girl)</td>
<td>51 (354)</td>
</tr>
<tr>
<td>Age (months)</td>
<td>4 (1)</td>
</tr>
<tr>
<td>Birth weight (kg)</td>
<td>3.5 (0.4)</td>
</tr>
</tbody>
</table>

- Randomisation – no baseline group differences
  - Infant - age, BW, wt-age-Z, breast feeding, gender, age solids
  - Maternal – age, education, SES index, intention to BF, pre-pregnancy weight status
## Feeding practices

<table>
<thead>
<tr>
<th>Feeding practice</th>
<th>Example question</th>
<th>Int vs cont</th>
<th>P value for group difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Concern child is overweight</td>
<td>How concerned are you about your child eating too much when you are not around her?</td>
<td>↓</td>
<td>0.02* 0.02*</td>
</tr>
<tr>
<td>Restriction</td>
<td>I have to be sure my child does not eat too many sweets</td>
<td>↓</td>
<td>0.06 0.003*</td>
</tr>
<tr>
<td>Pressure to eat</td>
<td>If my child says &quot;I am not hungry I try to get her to eat anyway&quot;</td>
<td>↓</td>
<td>&lt;0.001* &lt;0.001*</td>
</tr>
<tr>
<td>Instrumental feeding</td>
<td>I reward my child with something to eat when she is well behaved</td>
<td>↓</td>
<td>&lt;0.001* &lt;0.001*</td>
</tr>
<tr>
<td>Encouragement</td>
<td>I praise my child if she eats what I give her</td>
<td>↓</td>
<td>0.005* 0.01*</td>
</tr>
<tr>
<td>Emotional feeding</td>
<td>I give my child something to eat to make him feel better when he is upset</td>
<td>↓</td>
<td>0.04* 0.01*</td>
</tr>
</tbody>
</table>
Feeding practices (2)

• At both 2 year analysis and longitudinal 2-5 year analysis, intervention mothers reported using more responsive and less non-responsive feeding strategies in response to food refusal

• **BUT** use of coercive feeding strategies in response to feed refusal almost doubled from 2 to 5 years, and half to 2/3 of mothers in both groups reported using these strategies
Child eating behaviour outcomes

<table>
<thead>
<tr>
<th>Eating behaviour</th>
<th>Example question</th>
<th>Int vs cont</th>
<th>P value for group difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Satiety responsiveness</td>
<td>My child gets full up easily</td>
<td></td>
<td>0.03*</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>0.04*</td>
</tr>
<tr>
<td>Food responsiveness</td>
<td>My child’s always asking for food</td>
<td></td>
<td>0.06</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>0.04*</td>
</tr>
<tr>
<td>Emotional overeating</td>
<td>My child eats more when anxious</td>
<td></td>
<td>0.009*</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>0.09</td>
</tr>
<tr>
<td>Fussiness</td>
<td>My child refuses new foods at first</td>
<td></td>
<td>0.01*</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>0.06</td>
</tr>
</tbody>
</table>

- Over time (from 2 to 5 years), ALL children, regardless of intervention, showed more obesogenic eating behaviours (greater food responsiveness, emotional overeating, fussiness and less satiety responsiveness)
Dietary outcomes

• No group difference or group x time interaction, but significant overall change over time in veg and non-core food intake from 2 to 5 years

• **So** – all children’s dietary intake deteriorated from 2 to 5 years, regardless of intervention

• Intervention children also:
  – at 2 and 2-5 years, had a greater preference for fruit
  – had a higher ‘score’ for fruit and veg (P=.03) at 3.7 and 5 years (on CDQ)
Weight

At all follow-up assessments (age 2, 3.5 and 5 years) BMI Z-scores of intervention children were 16-17% lower than control children – overall group effect approached significance (p=0.06)
Conclusions

Early anticipatory guidance that targets ‘when, what, how’ of early feeding practices results in:

**Maternal**
- ↓ self-reported non-responsive and coercive feeding practices/strategies

**Child**
- Non-significant trend toward lower BMI Z-score
- ↑ satiety responsiveness
- ↓ food responsiveness
- ↑ preference for fruit
- ↑ fruit and vegetable score on CDQ

BUT for all participants – coercive feeding strategies and obesogenic feeding behaviours increased, and dietary intake declined over time
Why??

• ?? Changes in the life course from 2 to 5 yrs may increase susceptibility to environmental factors:
  – Greater parental work hours
  – Fewer home cooked meals
  – Increased access to energy dense / nutrient poor food
  – Greater socialisation
  – Food marketing to children etc etc

• Consistent with healthy beginnings trial (Sydney) – significant weight and dietary outcomes at 2 years, ALL disappeared by 5 years.

• Longer-term support and education for families of pre-schoolers relevant to life course is needed
Where to from here?

• Translation into practice – longer term support
• Small trial (NOURISH in the community), but similar challenges as RCT
• Early infancy as a target for recognising obesity risk and intervention
  – How do we assess / identify risk?
  – How do we engage families of infants ‘at risk’
  – How do we intervene…….?work with existing services
    - ? CYH ‘Getting to know your baby’, NGO’s
  – ? Revise/re-package program to suit ‘at-risk’ populations
Thank you

- NHMRC
  - Profs Karen Thorpe, Geraldine Naughton, Ann Farrell, Geoffrey Cleghorn, Geoffrey Davidson and A/Prof Jordana Bayer.
- HJ Heinz
- Meat Livestock Australia
- Department Health South Australia
- Food Standards Australian New Zealand
- QUT Faculty of Health, ihbi
- Channel 7 Children’s Research Foundation
References


Flinders University

inspiring achievement