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Child food supplementation programmes: Evidence and implications for public health

Review on which this evidence summary is based:

Kristjansson E., Francis D.K., Liberato S., Benkhalti J.M., Welch V., Batal M., et al. (2015). **Food supplementation for improving the physical and psychosocial health of socio-economically disadvantaged children aged three months to five years**. *Cochrane Database of Systematic Reviews*, Issue 3, Art. No.: CD009924.

Review Focus

P Children aged 3 months to 5 years from low- and middle-income families

I Supplementary food programmes

C No intervention

O *Primary Outcomes:* weight gain, height gain, weight-for-age scores, height-for-age scores, weight-for-height scores, psychomotor development, cognitive development.

Review Quality Rating:	9 (strong) *Details on the methodological quality are available here.*

Considerations for Public Health Practice

Conclusions from Health Evidence	General Implications
This high-quality systematic review is based on 32 studies (21 randomized controlled trials (RCT) and 11 controlled before-after studies (CBA). The RCTs were judged to be of moderate risk of bias, while the CBAs were considered to have high risk of bias; 26 of the studies were included in the meta-analyses. **Supplementary feeding programs:** • had positive effects on growth in low- and middle-income countries • showed moderate positive effects on psychomotor development • showed mixed effects on cognitive development • were generally more effective for younger children (less than two years of age) and for those who were poorer/less well-nourished • were generally more effective when provided in day care or feeding centres	The overall findings suggest that public health should implement feeding programmes for young children in low- and middle-income countries, but the authors highlight that good implementation is key. A range of feeding interventions, variety of foods, and range of nutritional adequacy and different modes of delivery were recommended as methods for implementation. However, as there was substantial leakage (redistribution of food within family) when children were fed at home, public health should explore ways to implement feeding programmes in day-care/feeding centres as these were found to be more effective.

Evidence and Implications	
What's the evidence?	**Implications for practice and policy**
1. Primary Outcome: Weight • Supplementary feeding had positive effects on growth in low- and middle-income countries. • **Meta-analysis of the RCTs showed that supplemented children gained an average of 0.12 kg more than controls over six months** (95% confidence interval (CI) 0.05 to 0.18, 9 trials, 1057 participants, moderate quality evidence). • **In the CBAs, the effect was similar; 0.24 kg over a year** (95% CI 0.09 to 0.39, 1784 participants, very low quality evidence). • In high-income countries, one RCT found no difference in weight, but in a CBA with 116 Aboriginal children in Australia, the effect on weight was 0.95 kg (95% CI 0.58 to 1.33).	**1. Primary Outcome: Growth** • Public health should support the implementation of supplementary feeding programmes for children in low- and middle-income countries. Feeding programmes have positive effects on *weight gain* for children. • Public Health should consider ways to implement these programs to ensure that leakage does not occur.
2. Primary Outcome: Height • **Meta-analysis of nine RCTs revealed that supplemented children grew an average of 0.27 cm more over six months than those who were not supplemented** (95% CI 0.07 to 0.48, 1463 participants, moderate quality evidence). • Meta-analysis of seven CBAs showed no evidence of an effect (mean difference (MD) 0.52 cm, 95% CI -0.07 to 1.10, 7 trials, 1782 participants, very low quality evidence).	**2. Primary Outcome: Height** • Public health should implement supplementary feeding programmes as there is compelling evidence that feeding programmes have positive effects on *height growth* for children.
3. Primary Outcome: WAZ – weight-for-age z-scores; HAZ - height-for-age z-scores; WHZ - weight-for-height z-scores • **Meta-analyses of the RCTs demonstrated benefits for weight-for-age z-scores** (MD 0.15, 95%CI 0.05 to 0.24, 8 trials, 1565 participants, moderate quality evidence), **height-for-age z-scores** (MD 0.15, 95% CI 0.06 to 0.24, 9 trials, 4638 participants, moderate quality evidence), **but not for weight-for-height z-scores** MD 0.10 (95% CI -0.02 to 0.22, 7 trials, 4176 participants, moderate quality evidence). • Meta-analyses of the CBAs showed no effects on WAZ, HAZ, or WHZ (very low quality evidence). Moderate positive effects for haemoglobin (SMD 0.49, 95% CI 0.07 to 0.91, 5 trials, 300 participants) were found	**3. Primary Outcome: WAZ, HAZ, WHZ** • Public health should implement supplementary feeding as there is compelling evidence that feeding programmes benefit *WAZ and HAZ* but not for *WHZ*. • Public Health should consider other interventions that target WHZ among children in low- and middle-income countries.

among the RCTs.	
4. Primary Outcome: Psychosocial outcomes • Eight RCTs in low- and middle-income countries assessed psychosocial outcomes. • Meta-analysis of two studies showed moderate positive effects of feeding on psychomotor development (SMD 0.41, 95%CI 0.10 to 0.72, 178 participants). • The evidence on cognitive development was sparse and mixed.	**4. Primary Outcome: Psychosocial outcomes** • While supplementary feeding programmes are effective for other primary outcomes, Public Health should consider other interventions that target psychosocial and cognitive development.
Legend: P – Population; I – Intervention; C – Comparison group; O – Outcomes; RCT – randomized controlled trials; CBA - controlled before-and-after studies; WAZ – weight-for-age z-scores; HAZ - height-for-age z-scores; WHZ - weight-for-height z-scores * **For definitions see the healthevidence.org glossary at http://www.healthevidence.org/glossary.aspx*	

Why this issue is of interest to public health in Canada

Household food insecurity is a significant public health problem in Canada. Approximately 8% of adults and 5% of children experienced food insecurity in Canada between 2007 and 2012.[1] It has been found that individuals who experience food insecurity tend to report: poor or fair health, poor functional health, long-term physical and/or mental disabilities, multiple chronic conditions, major depression, and a perceived lack of social support.[2] Households with children experience a higher rate of food insecurity than those without children.[3] In 2011–2012, 10.3% of households with children and 7.5% of households without children were food insecure.[3] Food insecurity may be harmful to children's healthy growth and development.[1] Living in a food-insecure environment poses numerous health risks for children due to lower consumption of fruits and vegetables, milk products, or other important sources of vitamins and minerals.[1] Such deficiencies may lead to serious health problems including obesity, developmental abnormalities, or a compromised immune system.[4] Research has shown that in an attempt to protect their children from food insecurity, adults will reduce the variety and quantity of their own meals to prevent children from going hungry.[5] This results in higher rates of food insecurity among adults.

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[1] Statistics Canada. (2015). *Food insecurity in Canada*. Retrieved from http://www.statcan.gc.ca/pub/82-624-x/2015001/article/14138-eng.htm#a4

[2] Vozoris, N.T., & Tarasuk, V.S. (2003). Household food insufficiency is associated with poorer health. *Journal of Nutrition, 133(1),*120-126. American Society for Nutritional Sciences.

[3] Statistics Canada. (2013). *Household food insecurity measures, by presence of children in the household, Canada, provinces and territories, occasional.* Retrieved from http://www5.statcan.gc.ca/cansim/a26?lang=eng&retrLang=eng&id=1050546&paSer=&pattern=&stByVal=1&p1=1&p2=50&tabMode=dataTable&csid=

[4] McIntyre, L., Connor, S.K., & Warren, J. (2000). Child hunger in Canada: results of the 1994 National Longitudinal Survey of Children and Youth. Canadian Medical Association Journal, 163(8), 961-965.

[5] McIntyre, L., Glanville, N.T., Raine, K.D., Dayle, J.B., Anderson, B., and Battaglia, N. (2003). Do low-income lone mothers compromise their nutrition to feed their children? *Canadian Medical Association Journal 168(6),* 686-691.

Other quality reviews on this topic are available on healthevidence.org

Suggested citation

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