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[Overview of Reviews]

Community-based supplementary feeding for food insecure, vulnerable and malnourished populations - an overview of systematic reviews

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ABSTRACT

Background

Supplementary feeding may help food insecure and vulnerable people by optimising the nutritional value and adequacy of the diet, improving quality of life and improving various health parameters of disadvantaged families. In low- and middle-income countries (LMIC), the problems supplementary feeding aims to address are entangled with poverty and deprivation, the programmes are expensive and delivery is complicated.

Objectives

1. To summarise the evidence from systematic reviews of supplementary feeding for food insecure, vulnerable and malnourished populations, including children under five years of age, school-aged children, pregnant and lactating women, people with HIV or tuberculosis (or both), and older populations.
2. To describe and explore the effects of supplementary feeding given to people in these groups, and to describe the range of outcomes between reviews and range of effects in the different groups.

Methods

In January 2017, we searched the *Cochrane Database of Systematic Reviews*, MEDLINE, Embase and nine other databases. We included systematic reviews evaluating community-based supplementary feeding, and concerning food insecure, vulnerable and malnourished populations. Two review authors independently undertook selection of systematic reviews, data extraction and 'Risk of bias' assessment. We assessed review quality using the AMSTAR tool, and used GRADEpro 'Summary of findings' tables from each review to indicate the certainty of the evidence for the main comparisons. We summarised review findings in the text and reported the data for each outcome in additional tables. We also used forest plots to display results graphically.

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Main results

This overview included eight systematic reviews (with last search dates between May 2006 and February 2016). Seven were Cochrane Reviews evaluating interventions in pregnant women; children (aged from birth to five years) from LMIC; disadvantaged infants and young children (aged three months to five years); children with moderate acute malnutrition (MAM); disadvantaged school children; adults and children who were HIV positive or with active tuberculosis (with or without HIV). One was a non-Cochrane systematic review in older people with Alzheimer's disease. These reviews included 95 trials relevant to this overview, with the majority (74%) of participants from LMIC.

The number of included participants varied between 91 and 7940 adults, and 271 and more than 12,595 children. Trials included a wide array of nutritional interventions that varied in duration, frequency and format, with micronutrients often reported as cointerventions. Follow-up ranged from six weeks to two years; three trials investigated outcomes at four to 17 years of age. All reviews were rated as high quality (AMSTAR score between eight and 11). The GRADE certainty ratings ranged from very low to moderate for individual comparisons, with the evidence often comprising only one or two small trials, thereby resulting in many underpowered analyses (too small to detect small but important differences). The main outcome categories reported across reviews were death, anthropometry (adults and children) and other markers of nutritional status, disease-related outcomes, neurocognitive development and psychosocial outcomes, and adverse events.

Mortality data were limited and underpowered in meta-analysis in all populations (children with MAM, in children with HIV, and in adults with tuberculosis) with the exception of balanced energy and protein supplementation in pregnancy, which may have reduced the risk of stillbirth (risk ratio (RR) 0.60, 95% confidence interval (CI) 0.39 to 0.94; 5 trials, 3408 women). Supplementation in pregnancy also improved infant birth weight (mean difference (MD) 40.96 g, 95% CI 4.66 to 77.26; 11 trials, 5385 participants) and reduced risk of infants born small-for-gestational age (RR 0.79, 95% CI 0.69 to 0.90; 7 trials, 4408 participants). These effects did not translate into demonstrable long-term benefits for children in terms of growth and neurocognitive development in the one to two trials reporting on longer-term outcomes. In one study (505 participants), high-protein supplementation was associated with increased risk of small-for-gestational age babies.

Effects on growth in children were mixed. In children under five years of age from LMIC, one review found that supplementary feeding had a little or no effect on child growth; however, a more recent review in a similar population found that those who received food supplementation gained an average of 0.12 kg more in weight (MD 0.12 kg, 95% CI 0.05 to 0.18; 9 trials, 1057 participants) and 0.27 cm more in height (MD 0.27 cm, 95% CI 0.07 to 0.48; 9 trials, 1463 participants) than those who were not supplemented. Supplementary food was generally more effective for younger children (younger than two years of age) and for those who were poorer or less well-nourished. In children with MAM, the provision of specially formulated food improved their weight, weight-for-height z scores and other key outcomes such as recovery rate (by 29%), as well as reducing the number of participants dropping out (by 70%). In LMIC, school meals seemed to lead to small benefits for children, including improvements in weight z scores, especially in children from lower-income countries, height z scores, cognition or intelligence quotient tests, and maths and spelling performance.

Supplementary feeding in adults who were HIV positive increased the daily energy and protein intake compared to nutritional counselling alone. Supplementation led to an initial improvement in weight gain or body mass index but did not seem to confer long-term benefit.

In adults with tuberculosis, one small trial found a significant benefit on treatment completion and sputum conversion rate. There were also significant but modest benefits in terms of weight gain (up to 2.60 kg) during active tuberculosis.

The one study included in the Alzheimer's disease review found that three months of daily oral nutritional supplements improved nutritional outcomes in the intervention group.

There was little or no evidence regarding people's quality of life, adherence to treatment, attendance at clinic or the costs of supplementary feeding programmes.

Authors' conclusions

Considering the current evidence base included, supplementary food effects are modest at best, with inconsistent and limited mortality evidence. The trials reflected in the reviews mostly reported on short-term outcomes and across the whole of the supplementation trial literature it appears important outcomes, such as quality of life and cost of programmes, are not systematically reported or summarised.

PLAIN LANGUAGE SUMMARY

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Supplementary feeding for groups of people that are food insecure, vulnerable and malnourished

What was the aim of this review?

To summarise the effect of supplementary feeding on populations that were food insecure, vulnerable and malnourished. The overview authors found eight systematic reviews examining supplementary feeding in a variety of populations.

Key messages

Across a range of vulnerable populations, supplementary feeding programmes sometimes show modest benefit in nutritional outcomes. In a few studies examining mortality (death), effects were either small or absent, and research mostly looked at short-term effects.

What was studied in the review?

Supplementary feeding means providing extra food to people or families over and above their home diet and has been used in populations that are food insecure (limited access to adequate and nutritious food) and vulnerable (including women and young children; school-aged children; people living with diseases such as tuberculosis, HIV, and Alzheimer's disease; and older people) to improve their health and quality of life.

What are the main results of the review?

The evidence presented here was current to January 2017. We found eight systematic reviews to include in this summary. These reviews included 95 studies (including up to 7940 adults, and more than 12,595 children in a few studies). Most of the included studies lasted from six weeks to two years, with only three studies following people for longer periods of time (up to 17 years). In these reviews, there were a wide range of different types of supplementary feeding given to vulnerable groups over different periods of time, and often in combination with vitamins or minerals.

In pregnancy, we found that energy and protein supplements that were balanced (i.e. providing adequate amounts of energy and nutrients, in this case protein) may have decreased the rate of stillbirth (death or loss of a baby before or during delivery), improved infant birth weight and reduced the risk of infants born small-for-gestational age (infants that are smaller than expected). We observed no long-term benefits for children in terms of growth and cognitive (intellectual) development (although very few studies reported long-term effects). High-protein supplements (containing protein in higher amounts) were associated with risk and harm (increased risk of small-for-gestational age babies).

We found that the effects of supplementary feeding on growth in children were varied. In children under five years of age from low- and middle-income countries, supplementary feeding had a small impact on child growth. We observed some benefits in terms of weight and height gains, especially in younger children (those younger than two years of age) and in those who were poorer or less well-nourished (or both). Some benefit could be seen in children with moderate acute malnutrition in terms of weight gain, other growth factors and recovery rate. School meals seemed to lead to a number of small benefits in school children (including improvements in weight, height, intelligence tests, and maths and spelling performance).

Supplementary feeding in adults who were HIV positive increased the daily intake of energy and protein and led to an early improvement in weight gain or body mass index (measure of whether someone is overweight or underweight), or both, but did not seem to lead to long-term benefits (although few studies reported long-term effects). In adults with tuberculosis (serious infectious lung disease), we observed small benefits in terms of weight gain during active tuberculosis.

In Alzheimer's disease (a type of dementia), providing a daily oral nutrition supplement for three months improved nutritional outcomes (such as weight and energy intake).

There was little or no evidence available regarding people's quality of life, adherence to treatment, attendance at clinic or the costs of supplementary feeding programmes.