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Interventions for increasing fruit and vegetable consumption in children aged five years and under

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Question

Are interventions designed to increase the consumption of fruits, vegetables or both amongst children 5 years and under effective, cost effective or associated with any adverse events?

Context

Eating sufficient amounts of fruit and vegetables is associated with a reduced risk of future non-communicable diseases (e.g. cancer and cardiovascular disease). While daily recommended amounts of fruit and vegetables for children do vary internationally, population surveys have indicated that these recommendations are often not being met. As early childhood also represents a critical period for establishing dietary habits that will continue into adulthood, interventions targeting fruit and vegetable intake in young children may be effective strategies to increase public health long-term.

This Cochrane review update therefore assessed the impact of interventions designed to increase eating of fruit, vegetables or both in children five years and under. This review was originally published in 2012 and has been maintained as a living systematic review since 2017. The review authors continue to monitor the publication of trials and update the review when needed as there are multiple ongoing trials that might impact the conclusions of this review in the future. The most recent version, discussed in this Cochrane Corner, was published in 2020.

Criteria for study selection

The review included studies assessing interventions aimed at increasing the intake of fruit or vegetables or both in children five and under. The studies had to compare these to other such interventions, standard care or no intervention. Moreover, the studies had to incorporate a dietary or biochemical assessment of vegetables or fruit consumption, e.g. changes in the number of portions or in grams consumed or changes in markers such as carotene.

Summary of the results

In total, the authors included 80 trials with 12965 participants. The mean age of participants varied widely for some interventions e.g. from 4 months to 5 years. Fifty trials examined the effect of child-feeding practices (e.g. repeated exposure or rewards) and 15 studies investigated parent nutrition education. Fourteen studies assessed the impact of multicomponent interventions which combined for example parent nutrition education and preschool policy changes. Few trials assessed the effect of nutrition education for children (2 trials) and of a child-focused mindfulness intervention (1 trial). Most of the trials took place in so-called developed countries, but studies focusing on disadvantaged populations and the general population were analyzed together. Seventy-six trials measured vegetable intake while only 36 assessed fruit consumption.

Child-feeding practices may have a small positive effect on child vegetable consumption compared to no intervention, resulting in an increase of 5.30 grams consumption of vegetables per day (no intervention: 7.7 grams vs child-feeding: 13 grams (95% CI*: 10.78 to 15.23); 19 studies, 2140 participants, low-certainty evidence). Similarly, multicomponent interventions probably have a small positive effect on consumption of fruit and vegetables, resulting in an increase of 0.34 cups per day (no intervention: 1.08 cups vs multicomponent: 1.42 cups (95% CI: 1.17 to 1.66); 9 trials, 2961 participants; moderate-quality evidence). These intake outcomes were measured in the short-term (<12 months) with mean follow-up being 8.3 weeks and 5.4 weeks respectively. It is uncertain whether there are any short-term differences in fruit and vegetable intake when comparing parent nutrition education to no intervention (very low-certainty evidence). The two trials on child education could not be combined in one analysis, but both reported a positive effect on fruit and vegetable intake (low-certainty evidence).

Unfortunately, very few studies assessed long-term impacts, cost effectiveness and unintended adverse consequence of the interventions so the authors were unable to draw any conclusions regarding these outcomes.

Conclusion

Although the authors identified 80 relevant trials, the evidence remains limited both regarding magnitude of effect as well as certainty of the evidence. Child-feeding practices may lead to, and multicomponent interventions probably lead to only small increases in fruit and vegetable intake by young children. Moreover, it remains uncertain whether parent nutrition education interventions increase children's fruit and vegetable intake.

As this is a living systematic review which incorporates relevant evidence as it becomes available, the conclusions are likely to change in the (near) future. The authors have already identified 15 new studies published between 2020 and 2022, which will be included when the review is updated.

Implications for practice

Multicomponent interventions could currently be considered the best option to increase fruit and vegetable intake for small children. Interventions that reported positive effects were largely those that focused exclusively on fruit and vegetable consumption (rather than nutrition generally), involved parents in some component of the intervention and included nutrition education. However the effects of both child-feeding and multicomponent interventions remain small (possibly not clinically relevant) and there is no data on costs and unintended consequences. This may limit the potential public health benefits of implementing these interventions.

^ **CI:** confidence interval

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