Evidence is scarce on preventive nutrition interventions for adolescents in low- and middle-income countries

Malnutrition is one of the most common causes of morbidity and mortality among adolescents in low- and middle-income countries (LMICs). Preventive measures include nutrition education and counselling; micronutrient supplementation/fortification and macronutrient supplementation. There are few studies assessing micronutrient supplementation and fortification programmes. What studies there are, are of low quality and generally find no effects.

There are no studies of other preventive measures, i.e., macronutrient supplementation or nutrition education and counselling.

What is this review about?
Malnutrition is one of the most common causes of morbidity and mortality among adolescents and is now considered to be one of the largest risk factors responsible for the global burden of disease, along with poor diet. This review assesses the impact of preventive nutrition interventions (including nutrition education and counselling; micronutrient supplementation/fortification and macronutrient supplementation) to improve the health and nutritional status of adolescents aged 10-19 years in low- and middle-income countries (LMICs).

What studies are included?
To be eligible for inclusion, studies had to be randomised controlled trials (RCTs), quasi-experimental studies, controlled before-after studies studies or interrupted time series studies evaluating the effectiveness of preventive nutrition interventions among adolescents between 10 and 19 years of age, from LMICs.

The review summarises evidence from 10 studies from 15 papers, which included 10,802 participants. All the included studies are RCTs assessing micronutrient supplementation and fortification. Adolescents girls were the intervention groups for all but one of the included studies.
No studies evaluating macronutrient supplementation or nutrition education and counselling were found.

Do micronutrient supplementation and fortification improve health and nutritional outcomes?

Overall, the evaluated interventions mostly did not have a significant positive effect on the assessed outcomes, although this conclusion is based on a few studies of low or very low quality. Specifically, there was no positive impact on any of the following outcomes:

- Anemia: No effect from iron supplementation with or without folic acid given daily or weekly
- BMI: No effect from any of calcium/vitamin D, iron supplementation with or without folic acid, zinc supplementation, multiple micronutrient fortification

Positive effects from calcium/vitamin D supplementation were found on serum 25(OH)D level while calcium only supplementation and calcium and vitamin D supplementation also showed some positive effect on total body bone mineral density.

What do the findings of this review mean?

The evidence on preventive nutrition interventions among adolescents from LMICs is too scarce for any conclusive implications for practice. The existing evidence is limited to micronutrient supplementation/fortification only. There is no evidence on nutrition education and counselling and macronutrient supplementation among adolescents.

Future studies assessing preventive nutrition interventions among adolescents in LMICs should focus on nutrition education and macronutrient supplementation. Future studies should be designed with follow-up periods and also assess any adverse effects.

There is a need for large-scale nutrition intervention programme evaluations from LMIC settings. Programmes targeting adolescents in LMICs should also report on contextual factors in planning, implementation and evaluation in light of the WHO health system building blocks. Future studies should target adolescent boys and girls.