

An adolescent mother
in Sierra Leone

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Supplementary feeding and infection control in pregnant adolescents in Sierra Leone

This is a summary of the following paper: Koroma A, Ellie M, Bangura K et al (2023) *Supplementary feeding and infection control in pregnant adolescents – A secondary analysis of a randomised trial among malnourished women in Sierra Leone. Maternal & Child Nutrition*, 19, e13456 <https://doi.org/10.1111/mcn.13456>

Undernutrition in pregnancy during adolescence carries a high risk of maternal morbidity and poor birth outcomes. This study performed a secondary data analysis to test the hypothesis that, during pregnancy, undernourished adolescents would benefit more than adults from an intervention consisting of a daily ration of supplementary food and anti-infective treatments.

The original randomised controlled trial was conducted in Sierra Leone and enrolled 236 younger adolescents (aged under 18 years), 454 older adolescents (aged 18–19 years) and 741 adults (aged 20 years or above), all with a mid-upper arm circumference of 23cm or more. Both control and intervention groups received treatment, albeit under different regimens. The intervention arm received antibiotic and antimalarial

treatment at multiple stages of pregnancy, plus a daily ration of ready-to-use supplemental food throughout (18g protein and a broad range of micronutrients). The control arm received daily corn-soy blended flour, palm oil and a sharing ration in line with World Food Programme standards (17.5g protein), plus iron and folic acid during the second and third trimesters.

When evaluating outcomes, irrespective of the intervention group, younger adolescents had a similar rate of weight change compared to adult mothers. Younger adolescent mothers had newborns with lower birth weight, length and mid-upper arm circumference, as well as higher proportions of low birth weight and stunted newborns compared to adult mothers.

Overall, while the intervention proved effective when all ages were pooled together,

there were significant differences in effect between each maternal age group. These results were not as expected. Younger adolescent mothers benefited less from the combined intervention than adult mothers regarding the rate of weight gain during pregnancy and infant birth weight, length and rate of low birth weight. Younger adolescents also benefited less than older adolescents, although differences did not reach statistical significance.

The findings reinforce what has been seen in other studies: that younger adolescent mothers tend to give birth to babies with lower birth weight, length and mid-upper arm circumference than adult mothers. These findings do not, however, indicate that supplementary food is not beneficial when treating undernourished adolescents, as the analysis was not structured as supplementary food versus no supplementary food, so the results should be viewed with care.

There were limitations to the study. As a post hoc analysis (conducted after the dataset was already viewed), the incidence of multiple testing increased the chance of false positive results. Strengths included a large sample size and a robust design of the original trial. Further investigation is required to determine if the findings are comparable in different environments, as this was conducted in a rural West African context.

The findings may suggest that there are unaddressed barriers to nutrient transfer, improved length of gestation and/or other factors essential for foetal development, especially in the most vulnerable young adolescents.

Fortified balanced energy protein supplementation for pregnant women in Burkina Faso

This is a summary of the following paper: Hanley-Cook G, Toe LC, Tesfamariam K et al (2022) *Fortified balanced energy-protein supplementation, maternal anemia, and gestational weight gain: A randomized controlled efficacy trial among pregnant women in rural Burkina Faso. The Journal of Nutrition*, 152, 10, 2277–2286. <https://doi.org/10.1093/jn/nxac171>

Anaemia and suboptimal gestational weight gain (GWG) are associated with adverse maternal and birth outcomes. Maternal GWG is a cumulative measure reflecting the altering physiology of the mother, specifically the changes in maternal and foetal weights across pregnancy.

This randomised controlled trial, which took place in rural Burkina Faso, enrolled pregnant women aged 15–40 at <21 weeks of gestation. The study assessed the efficacy of a micronutrient-fortified balanced energy protein (BEP) supplement on the outcomes of anaemia, GWG, and GWG rate in relation to the Institute of Medicine (IOM)'s recommendations (categorised into severely inadequate, inadequate and excessive GWG), compared against iron-folic acid supplementation.

Women in the intervention group received a daily fortified BEP supplement and an iron-

folic acid tablet, whereas women in the control group only received the iron-folic acid tablet. The BEP supplement was a daily 72 g lipid-based nutrient supplement in the form of an energy-dense peanut paste fortified with multiple micronutrients. The BEP supplement provided 393 kcal/d and 22 mg/d of iron. All women received malaria prophylaxis at the relevant antenatal care visits. Haemoglobin (g/dL) concentrations were measured at baseline and at the third antenatal care visit, whereas maternal weight was measured at baseline and at all subsequent ~7-weekly antenatal care visits. Statistical analyses followed the intention-to-treat principle.

A total of 2,016 women were assessed for eligibility, of whom 1,897 were randomly assigned (960 control, 937 intervention) and 119 were excluded for not meeting the trial's inclusion criteria. Approximately 3% of both control and

intervention arms were lost to follow-up at the third antenatal care visit. A further 22 control (2.42%) and 27 intervention arm mothers (3.07%) were lost to follow-up before delivery.

The results show that a combined daily BEP and iron-folic acid tablet had no effect on maternal Hb concentration, anaemia or prevalence of severe anaemia. In the combined BEP and iron-folic acid arm, maternal GWG was 6.27 kg, and the GWG rate was 0.274 kg/week, but both indicators showed no significant difference in comparison with the control arm. There were also no significant differences between study arms in terms of GWG adequacy, inadequate GWG, severely inadequate GWG or excess GWG prevalence. The main (null) findings were further confirmed by subsequent models that adjusted for various factors at baseline, as well as by the per-protocol analysis. Nonetheless, the full case analysis showed small but significant differences in absolute GWG and GWG adequacy.

In conclusion, the study showed that fortified BEP supplementation did not reduce maternal anaemia, nor did it increase GWG, in comparison with iron-folic acid. The authors suggest that future randomised interventions might assess whether preconception environments conducive to adequate GWG allow the mother to be more nutritionally replete, therefore channelling the additional nutrients from supplementation to support improved foetal growth and development.