

Antenatal malaria prophylaxis plus iron and folic acid for child nutrition outcomes

This is a summary of the following paper: *Godha D, Tharaney M, Nanama S et al. (2022) The association between iron and folic acid supplementation and malaria prophylaxis and linear growth among children and neonatal mortality in Sub-Saharan Africa – A pooled analysis. Nutrients, 14, 2296. <https://pubmed.ncbi.nlm.nih.gov/36364759/>*

Many studies have highlighted a positive association of iron and folic acid (IFA) supplementation during pregnancy with foetal growth and birth weight. However, few have explored associations with a child's linear growth beyond birth. Moreover, much of the evidence base has been built in South Asia. In sub-Saharan Africa (SSA), malaria remains endemic, which complicates interventions. Malaria infection increases the risk of anaemia, while also reducing iron absorption, yet IFA supplementation increases malaria risk, with iron deficiency reducing it.

This study aimed to explore whether a combined antenatal regimen of IFA supplementation and malaria prophylaxis influences linear growth outcomes among children. A pooled analysis was conducted using recent Demographic and Health Survey data from 19 SSA countries. Four outcomes were analysed: severe stunting, stunting, height-for-age z scores (as a continuous variable), and neonatal mortality. In total, results from a sample size of 56,388 children (for severe stunting, stunting, height-for-age z-scores) and 90,503 (for neonatal mortality) were analysed.

A full breakdown of the methodology used and the specific results by country are beyond the scope of this summary. Both can be found in the original paper.

The odds of stunting were found to be 10% lower for children of mothers who received malaria prophylaxis (OR 0.90, $p < 0.05$) after adjusting for multiple factors. No similar association was noted with severe stunting. After adjustment, neonatal mortality was reduced by almost 30% for children of mothers who received malaria prophylaxis (OR 0.72, $p < 0.01$). Multivariate regression found that IFA supplementation for more than 90 days combined with malaria prophylaxis during pregnancy was the most favourable regimen – showing a weak yet significant ($p < 0.05$) correlation with height-for-age z-scores.

After adjustment, no significant relationship was observed for either iron supplementation alone or IFA supplementation during pregnancy and child stunting. Moreover, after adjustment, no significant relationship was observed for iron supplementation and neonatal mortality.

These findings run contrary to those from Asian settings, where IFA supplementation is significantly correlated with linear growth and reduced neonatal mortality. Considering that malaria remains endemic across many parts of Africa, it is possible that any positive effects from supplementation were overridden by malaria infection.

This paper is complex in nature with multiple regression models and outcomes being considered, each with seemingly contrasting findings. Nevertheless, two practical lessons can be taken from the findings:

First, malaria prophylaxis during pregnancy remains important for reducing infant stunting and neonatal mortality in malaria-endemic regions.

Second, combining malaria prophylaxis with IFA supplementation appears to be effective in increasing linear growth, but it is important for health systems and practitioners to consider the complex relationship between these two strategies.

Although the study had its limitations, steps were taken to minimise bias and a large sample size was used for this analysis, which increases the reliability of these results. The authors present both adjusted and unadjusted regression models and, due to the scope of this summary, we have only presented the adjusted findings. We encourage readers to review the original paper to see how these regression models were created and confounders accounted for.

A home-based nutritional intervention for preschool children: Evidence from India

This is a summary of the following paper: *Ansuya B, Baby S, Unnikrishnan B et al. (2023) Impact of a home-based nutritional intervention program on nutritional status of preschool children: A cluster randomized controlled trial. BMC Public Health, 23, 51. <https://bmcpublihealth.biomedcentral.com/articles/10.1186/s12889-022-14900-4>*

A community-based cluster randomised controlled trial design was used for this study in rural southwestern India. All 253 participants were aged 3–5 years, had moderate (weight-for-age < -2 to -3 standard deviations) or severe underweight (< -3 standard deviations), and mothers who were registered¹ centres. Control and intervention groups were randomised at a 1:1 ratio (see Box 1). Measurements were taken every month throughout the 12-month intervention period.

Both groups gained weight at a steady rate across the 12-month period – as expected – but the intervention groups' growth trajectory was steeper. Average weights within the intervention group remained higher and accelerated away from the control group at each measurement, concluding with an average weight difference of 0.82 kilograms between the groups ($p < 0.001$) at the end of the study. In the intervention group, the percentage of children moderately underweight reduced from 41.5% to 24% in 12 months, while severe underweight reduced from 8.6% to

3.16%. Only minimal changes were observed in the control group.

Cluster randomisation was valid for this setting. This method usually requires a larger sample size to see an effect – compared to individual randomisation, which is the gold standard – but in this case an appropriate sample size calculation was applied that also accounted for attrition. The researchers then enrolled slightly more children than needed, even though there was no dropout and zero mortality by study conclusion, so this study was appropriately powered.

The data are compelling and show a clear benefit of this intervention within this population. This trial would need to be expanded to a broader group to infer results about a larger population, but the methodology was robust, and the effect size was large – allowing us to be confident in these findings.

Although both arms of the study had comparable weights at baseline and most other characteristics did not differ significantly, more children in the intervention group were below the poverty

line (9.4%) than those in the control group (0.8%). Conversely, there were more middle-income households within the control group (23.8%) than the intervention group (15.7%). As weights were comparable, this difference may be insignificant. However, it is plausible that the lower socio-economic status group adhered more strictly to the intervention as they placed more value in it. By contrast, higher-income households may have seen this as less of a priority. This could affect our interpretation until further results from a wider study group are published.

Box 1 The intervention

The primary outcome of this study was to measure weight gain in participants. The intervention was a home-based health education and recipe demonstration session delivered by a single investigator. The session covered the preparation of 15 protein and iron-rich recipes and the risk factors and aetiology of malnutrition, among other things. Participants were then provided with a further educational resource so that mothers could read in more detail about malnutrition and its determinants after the session.

Mothers completed food diaries and took photos of recipe preparation to evidence adherence to the protocol.

¹ 'Anganwadi' is a type of rural childcare centre in India. They provide basic healthcare as part of the public health system through workers who are less qualified than doctors or nurses, but who live in communities and can provide local insight and necessary social skills to promote healthcare.