

Family Care Indices and Linear Growth Predict INTER-NDA Scores for Child Development at Age 2 Years: Findings From the “Women First” Trial

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Objectives: Nutrition during fetal and early postnatal life impacts brain development, however evidence from randomized trials from low-and-middle-income countries (LMIC) is limited. We evaluated effects of maternal nutrition supplementation before and during pregnancy on neurodevelopment and vision in children from 4 LMIC with high rates of stunting, using a simplified assessment tool.

Methods: Women First was an individually randomized trial comparing the impact of maternal nutrition supplementation initiated preconception vs at ~12 wk gestation vs no supplement; interventions were discontinued at delivery in trial sites in Democratic Republic of the Congo, Guatemala, India, and Pakistan. Neurodevelopment and visual acuity and visual contrast sensitivity were assessed at 24 mo using the

INTER-NDA and the Cardiff tests, respectively, in a random sub-set, representing ~1/3 of infants with valid birth measurements from the WF trial. Anthropometry and Family Care Indicators (FCI) were also obtained at 24 mo.

Results: 667 and 634 children (91% and 86% of sub-set) were included in INTER-NDA and vision analyses. Arm-proportionate contribution was 32.2–32.8%. Overall, we observed the following percentage of children with delays: 66.6% cognitive; 87.4% fine motor; 91.3% gross motor; and 11.7% language; 25.9% had positive behavior problems; and 26.0% and 21.0% had low acuity and contrast sensitivity scores, respectively. WF intervention arm was not significant for INTER-NDA scores, rates of mild-to-moderate or severe delay ($F = 0.004$ – 1.518 , $p = 0.28$ – 0.99 ; $X^2 = 3.81$ – 5.92 , $p = 0.18$ – 0.42 ; $X^2 = 3.81$ – 6.33 , $p = 0.18$ – 0.43); or for low acuity and contrast sensitivity ($X^2 = 0.91$, $p = 0.63$ and $X^2 = 1.64$, $p = 0.44$). LAZ_{24mo} was significantly associated with cognitive, motor, language, and behavior scores; maternal education predicted cognitive, language, and vision; and FCI was significantly associated with fine motor, language, and behavior after adjusting for other covariates (R^2 0.33 cognitive; 0.40 language; 0.12 motor; 0.05 positive and 0.11 negative behavior; and 0.31–0.34 for vision models).

Conclusions: The findings highlight the association between child development, linear growth, and family environment.

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