

SUPPLEMENTARY FILE

This appendix has been provided by the authors to give readers additional information about their work.

Supplement to: Martinez B, Farley Webb M, Gonzalez A, et al. A complementary feeding intervention on stunted Guatemalan children: A randomized controlled trial.

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SUPPLEMENTARY METHODS

Data Monitoring and Fidelity. All study data was captured on paper forms and then double entered in REDCap. Through the study, bimonthly data quality checks for missing values, data entry discrepancies, and outliers was conducted by the supervising study physician. Failures of REDCap validation and outlier rules as well as double data entry discrepancies were checked manually against original paper forms.

Study nurses were trained on anthropometric and 24-hour diet recall collection using standard methods by a supervising study physician.[1, 2] All anthropometric measurements were completed in triplicate during each study visit. Weight was measured to the nearest 0.1 kg with the use of a Seca 310 hanging scale (Seca, Hamburg, Germany), and length/height was measured to the nearest 0.1 cm with the use of a locally constructed portable length board constructed according to UNICEF specifications.[3] For primary outcome analysis, we used the mean of the first two readings if they did not differ more than a pre-specified tolerance limit (length/height \leq 0.5 cm, weight \leq 0.2 kg). If they differed more, the third measurement was then compared with the first and second measurements and the pair of measurements that had smaller difference was used to calculate the mean.

On-going quality control, via data review and random audits of in-field operations (recruitment, anthropometric techniques, 24-hour dietary recalls, and exit visits), was performed by a study physician. The auditor performed a triplicate of height and weight measurements of the children and compared results to the measures obtained by the study nurse, at the same time evaluating the measuring technique. The auditor also performed a separate 24-hour dietary recall with the children's caregiver, and then compared results with the data obtained by the nurse or CHW. Timely feedback was provided to the study staff

when inconsistencies were discovered. Study nurses and CHWs also participated in bimonthly anthropometry standardization exercises in which the technique, precision, and reliability of their measurements were evaluated. Seven percent of CHW home visits in the intervention arm and 8% in the control arm were audited by a study physician for fidelity of delivery.

Study Interventions. For subjects in both study arms, the study duration was 6 months from enrollment. The usual care arm was modeled on the Guatemalan government's "Zero Hunger" guidelines for community-based nutrition.[4] Under usual care, primary caregivers and enrolled children received a home visit from the 2-person CHW team every 30 days for growth monitoring (length/height and weight). Other specific elements provided included: a daily multiple micronutrient powder supplement ("Chispitas"/Sprinkles, daily dose composition: ferrous fumarate 12.5 mg, zinc gluconate 5 mg, retinol acetate 300 mcg, folic acid 160 mcg, and ascorbic acid 30 mg, manufactured by Prodipa S.A., Guatemala City, Guatemala); a biweekly food ration rich in protein (beans 1000 g., eggs 20 units, and *Incaparina* 900 g. (a soy-based complementary food supplement commonly used in Guatemala, manufactured by Alimentos S.A., Guatemala City, Guatemala); and generic messages about complementary feeding based on WHO guidelines (continued breastfeeding on demand; appropriate consistency of complementary foods; appropriate age-adjusted meal frequency; provision of a diversity of foods).[5]

For the intervention arm, subjects received micronutrient powder supplements and food rations as described above for usual care. In addition, they received a visit every 30 days from a separate 2-person CHW team. At this visit, growth monitoring was conducted, followed by a structured 24-hour diet recall interview eliciting the child's feeding practices during the preceding day.[2] At each visit, individualized subject data obtained from this

interview pertaining to continued breastfeeding, complementary food consistency, meal frequency, and food diversity were reviewed with the primary caregiver and contrasted to standard key recommendations (as above, from usual care). Open-ended questions were then used to explore the caregiver's perceptions of the child's dietary adequacy, highlight positive dietary changes since the preceding visit, and set concrete goals for the subsequent visit.

SUPPLEMENTARY RESULTS

Table S1. Feeding Practices Indicators Definitions by Child's Age¹

Feeding Practices Indicator	Age range	
	6 to 8 months	9 to 23 months
Minimum dietary diversity	Received food from ≥ 4 food groups during previous day	
Minimum meal frequency		
- Breastfeed children	≥ 2 solid, semi-solid, or soft foods during previous day	≥ 3 solid, semi-solid, or soft foods during previous day
- Non-breastfeed children	≥ 4 solid, semi-solid, or soft foods or milk feeds during previous day	
Minimum acceptable diet	Meeting both Minimum dietary diversity and Minimum meal frequency during previous day	

¹ Adapted from: World Health Organization. Indicators for Assessing Infant and Young Child Feeding Practices: part 1: definitions. Washington, D.C.: World Health Organization 2007.

Table S2: Baseline Characteristics of Study Participants Lost to Follow-up

Characteristics¹	Completed Study (N=296)	Lost to Follow-up (N=28)	p-Value²
Maternal Characteristics			
Age – yrs	27.2 ± 6.7	26.1 ± 7.4	0.42
Education – yrs	2.3 ± 2.5	1.8 ± 2.0	0.29
Literacy – no. (%)	164 (55)	14 (50)	0.58
Parity	3.4 ± 2.1	3.0 ± 2.1	0.30
Child Characteristics			
Male – no. (%)	165 (56)	17 (61)	0.61
Age at enrollment – months	15.4 ± 5.2	15.7 ± 5.6	0.83
Length/height-for-age Z-score	-3.41 ± 0.71	-3.71 ± 0.98	0.04
Weight-for-age Z-score	-1.95 ± 0.76	-1.81 ± 0.90	0.36
Weight-for-length/height Z-score	-0.14 ± 0.87	0.32 ± 0.97	0.009
Feeding Practices Indicators			
Minimum dietary diversity – no. (%)	157 (53)	16 (57)	0.68
Minimum meal frequency – no. (%)	254 (86)	25 (89)	0.61
Minimum acceptable diet – no. (%)	142 (48)	15 (54)	0.57
Household Characteristics			
Family Poverty Score	27.8 ± 10.9	28.0 ± 9.9	0.94

¹ Plus minus values are means ± SD. ² P values calculated using Student's t-test for continuous variables and the chi-square test for categorical variables.

Table S3. Linear Mixed Effects Regression Model Results (MIXED output from STATA 13).

Number of observations= 592
 Number of groups= 296
 Obs per group: min = 2 avg = 2 max = 2
 Log restricted-likelihood = -496.68571 Wald chi2 (8) = 34.89
 Prob > chi2 = 0.0000

LAZ/HAZ	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
Time	-.0236424	.0378875	-0.62	0.533	-.0979005	.0506157
Female	.3007562	.0749057	-4.02	0.000	.1539438	.4475686
Age at enrollment (mo)	-.0056849	.0072309	-0.79	0.432	-.0198571	.0084874
Family Poverty Score	.009134	.0037486	2.44	0.015	.0017869	.016481
Number children <5						
1 child
2 children	-.1242524	.0846956	-1.47	0.142	-.2902528	.0417479
>3 children	-.2433294	.1253281	-1.94	0.052	-.4889681	.0023092
Time#Arm						
1 1	.0313972	.0790582	0.40	0.691	-.1235541	.1863485
2 1	.102212	.0790582	1.29	0.196	-.0527393	.2571633
_cons	-3.338788	.1894503	-17.62	0.000	-3.710104	-2.967473

Random-effects Parameters	Estimate	Std. Err.	[95% Conf. Interval]	
Identifier: Identity				
var (_cons)	.3486255	.0338065	.288282	.4216002
var (Residual)	.1083773	.0089388	.0922003	.1273926

LR test vs. linear regression: chibar2(01) = 255.42 Prob >= chibar2 = 0.0000

Table S4: Minimum Diet Diversity Outcome Stratified by Age Group

Baseline Age group (mo)	Individualized Education (Intervention) Arm (N=145)*	Usual Care Arm (N=151)*	Risk Ratio (95% CI)	Risk Difference (95% CI)
6 to 11	37/40 (92.5)	34/48 (70.8)	1.31 (1.07 to 1.60)	21.7 (5.3 to 38.0)
12 to 17	46/49 (93.9)	39/54 (72.2)	1.30 (1.09 to 1.56)	21.7 (7.3 to 36.0)
18 to 24	52/56 (92.9)	42/49 (85.7)	1.08 (0.95 to 1.24)	7.1 (-4.8 to 19.1)

* Data are no./total no. (%).

Table S5: Daily Consumption of Different Food Groups

Food Group	Individualized Education (Intervention) Arm (N=145)*	Usual Care Arm (N=151)*	Risk Ratio (95% CI)	Risk Difference (95% CI)
Grains, roots and tubers	145 (100)	149 (98.7)	1.01 (0.99 to 1.03)	1.3 (-0.1 to 3.2)
Legumes and nuts	120 (82.8)	100 (66.2)	1.25 (1.09 to 1.43)	16.5 (6.7 to 26.4)
Dairy products	23 (15.8)	20 (13.2)	1.20 (0.69 to 2.08)	2.6 (-5.5 to 10.7)
Flesh foods	67 (46.2)	55 (36.4)	1.27 (0.96 to 1.67)	9.8 (-1.5 to 21.0)
Eggs	114 (78.6)	103 (68.2)	1.15 (1.00 to 1.32)	10.4 (0.3 to 20.5)
Vitamin A rich fruits and vegetables	124 (85.5)	110 (72.8)	1.18 (1.04 to 1.32)	12.7 (3.4 to 21.9)
Other fruits and vegetables	114 (78.6)	113 (74.8)	1.05 (0.93 to 1.19)	3.8 (-5.9 to 13.5)

* Data are no. (%).

SUPPLEMENTARY REFERENCES

1. Cogill B. Anthropometric Indicators Measurement Guide. Washington, D.C.: Food and Nutrition Technical Assistance Project 2003.
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5. World Health Organization. Guiding Principles for Complementary Feeding of the Breastfed Child. Washington, DC: World Health Organization 2004.