Caregivers' Nutritional Knowledge, Income and Children's Intake across three Ecological Zones in Ghana. The ENAM Study

Introduction and justification

The widespread prevalence of multiple micronutrient deficiencies in Sub-Saharan Africa is associated with diets low in animal source foods (ASF) (1). Intakes among children may be limited by ASF availability (is it present in the community?), accessibility (is it affordable?), or utilization (is it given to children?). Preliminary studies conducted in Ghana showed that coupled with the typical plant-based diets, children are not fed special foods; they consume the diet of the family, which in low-income households is plant-based resulting in low feeding frequency (2) further contributing to the childhood malnutrition.

In addressing all three levels of food security (availability, accessibility and utilization) especial with respect to ASF, the Enhancing Child Nutrition through Animal Source Food Management (ENAM) project through a multi-disciplinary approach employed a nutritional education and entrepreneurial intervention package to caregivers in selected communities across three main agro-ecological zones in Ghana with the ultimate aim of improving children's consumption of ASF. The rationale was that women's engagement in income-generating activities (IGA) gives them increased control over financial resources which results in an immediate impact on household food security and health (3) particularly that of their children. The pathway through which women will feed their 2-to 5 yrs. old children with available and /or accessible foods (particularly ASF) which may be a result of increased income (leading to her increase contribution to food expenditures available to purchase ASF) may be mediated by their knowledge of the importance of ASF to children's health and overall growth.

This objective of this current analysis was to evaluate the projects' impact on caregiver's nutritional knowledge from the baseline to final follow up (time point 4) and how knowledge influenced their children's ASF diversity.

Methods and procedures

Longitudinal panel data of project intervention participant caregivers (n=134) and matched non-participants in intervention communities (n=118) and control communities (n=261) in three ecological zones in Ghana was collected at baseline and at four different follow-ups, four months apart. This study was approved by the ethical review boards of the Noguchi memorial institute of the University of Ghana, legon and Iowa State University. With respect to caregivers' child nutrition knowledge, caregivers were asked to select local food items that were rich sources of iron (or foods for blood), calcium (or foods for strong bones and teeth), and vitamin A (or foods for good eyesight) using a card sort process with pictures of local foods. Caregivers' selections were then recorded on the questionnaire. Caregivers were also asked the number of times in the past week that their 2-to 5yrs old child consumed ASF from a list of 10 ASF categories comprising livestock meats (goat, sheep and beef), organ meats and offal, bush meats (wild game such as grasscutters, deer), whole fish, fish powder, shell fish, snails, poultry (chicken, guinea fowl), eggs, and milk and milk products. Data were entered and analysed using SPSS version 19.

Results

Background characteristics

Significantly more caregivers in the intervention group were engaged in an income generating activity at baseline (Table 1). There were no group differences between other household and caregivers' characteristics- Food security, child's ASF diversity and caregivers' nutritional knowledge and caregivers' income- before intervention.

Table1. Selected household and caregiver characteristics at baseline

Characteristics	Caregivers' participation Status						P-value
	Participants			Non participant			
Household wealth rank							
Low rank	55.3			63.1			0.10
Medium/High	44.7			36.9			
Married (%yes)	86.6			89.5			*0.33*
Working (%yes)	97.8			93.4			*0.03*
Fishing/Farming	36.8			67.9			
Trading	59.8			27.9			*<0.01*
Other	3.4			4.2			
Age (yrs)[a]	32.9	±	0.6	33.2	±	0.5	0.97
Formal education (yrs)	3.5	±	0.2	3.5	±	0.3	0.08

[a] Mean ± SE; * Significant group difference ($p<0.05$)

Project's Impact Final time (follow four)

Compared to non-participant and control caregivers, the nutritional knowledge and incomes of intervention participant caregivers had improved and was higher at final follow up ($p< 0.01$). Also children of intervention caregivers consumed significantly more diverse ASF (Table2).

Although nutritional knowledge increased significantly (among the intervention caregivers), increase, decrease and unchanged knowledge score did not predict their children's ASF diversity rather the caregivers' incomes did. However among intervention participants living in the Guinea Savannah, compared to living in the Forest Transitional zone (which has more diversified ASF due it being a major food market with lots of different economic activities etc.) negatively predicted children's ASF diversity (Adjusted R-squared =0.227; $p<0.001$).

Table2. Changes in children's ASF diversity and caregivers' nutritional knowledge by caregiver's project participation at final follow up.

	Caregivers' participation Status		
	Participant	Non Participant	P-value
ASF Diversity[a]	6.3 ± 0.2	4.6 ± 0.1	<0.01
Change in score from between baseline			
% Increased	57.0	40.9	<0.01
% Decreased	25.2	18.6	
% Unchanged	57.0	40.9	
Knowledge Score	37.2 ± 1.8	22.2 ± 0.7	<0.01
Change in score from between baseline			
% Increased	80.4	60.6	<0.01
% Decreased	16.8	32.6	
% Unchanged	2.8	6.8	

[a] Mean ± SE; Significant group difference ($p<0.05$)

Implications of findings

The results of this study emphasize the multi-disciplinary approach in targeting improvement in Hidden hunger (micronutrients status) of children through the intake of more bioavailable nutrients found in animal source foods in low income countries like Ghana. Results are indicative of the strong influence of location of a household in relation to ASF availability even among intervention groups and how interventions need to factor location difference in achieving utmost impact. Although the project showed a positive impact of the consumption of ASF by children of intervention caregivers, further analysis including exploring possible interactions between specific intervention factors (example, how knowledge interacts with income) on the expected outcomes needs to be done to further understand the pathways in which children's dietary intakes can be improved in low income households.

Reference

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