



Child Nutrition and Development in Rural El Salvador

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Abstract

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Background: In El Salvador, the most densely populated country in Central America, 35% of households live in multidimensional poverty. The World Food Programme estimates that 14% of Salvadoran children ages 6 to 59 months are chronically undernourished (World Food Program, 2016). In Estancia, Morazán, a cluster of rural villages in northeastern El Salvador, the statistics are even more concerning; a 2014 study of children 6 to 24 months of age found nearly 30% of children had a weight for age z-score less than or equal to -2 and nearly 70% had a height for age z-score less than or equal to -2. Additionally, an estimated 25% of three and four-year old children in El Salvador have a low Early Childhood Development Index (ECDI) score (McCoy et al, 2016). Doctors for Global Health partnered with a local non-governmental organization, *La Asociación de Campesinos para el Desarrollo Humano* (Peasant Association for Human Development, CDH), and facilitated the creation of Centers for Integrated Child Development (CICD) for children two – six years of age; children receive a curriculum that includes motor, language, and socio-emotional activities and nutritional supplementation. The effect of these centers on child development and nutritional outcomes are unknown.

Methods: We conducted 255 in-home surveys across eight communities in Estancia from September 2015 through February 2016. Two of the eight communities surveyed had CDH-sponsored CICD's. We collected the following information: sociodemographic; food security using the Latin American and Caribbean Household Food Security Scale, which incorporates food availability, access, and allocation of food within the household to estimate vulnerability (ELCSA has been internally and externally validated across Latin America); food frequency; child development using Ages and Stages (available in Spanish and validated in low and middle-income countries), and child anthropometric data (weight, length/height). Using SPSS software, we analyzed the impact of early child development centers on nutritional status and achieving age-appropriate developmental milestones.

Results: Children living in communities with CICD's had significantly greater weight-for-age z-scores. However, there was no relationship between height for age z-scores and attendance at CICD's. Children attending CICD's had statistically significantly better communication scores, fine motor skills, social interaction skills, and problem solving. There was no association between attending CICD's and improved gross motor skills.

Conclusions: Children who attended CICD's in Estancia, El Salvador had better nutritional status and developmental measures than those who did not attend. The dual focus of the CICD's on nutrition and early stimulation/education may provide a useful model for reducing childhood undernutrition and improving child development in El Salvador and globally.

Introduction

- In El Salvador, it is estimated that 35% of households live in multidimensional poverty.
- The World Food Programme estimates that 14% of Salvadoran children ages 6 to 59 months are chronically undernourished (World Food Program, 2016).
- In the rural region of Estancia, Morazán, a 2014 study of children 6 to 24 months of age found nearly 30% of children had a weight for age z-score less than or equal to -2 and nearly 70% had a height for age z-score less than or equal to -2 .
- It is estimated that 25% of three and four-year old children in El Salvador have a low Early Childhood Development Index (ECDI) score (McCoy et al, 2016).
- In order to address the concerns of childhood malnutrition and developmental delays, Doctors for Global Health partnered with a local non-governmental organization *La Asociación de Campesinos para el Desarrollo Humano* (Peasant Association for Human Development, CDH), and facilitated the creation of Centers for Integrated Child Development (CICD) for children two – six years of age.
- Children who attend the CICDs receive a curriculum that includes motor, language, and socio-emotional activities and nutritional supplementation.

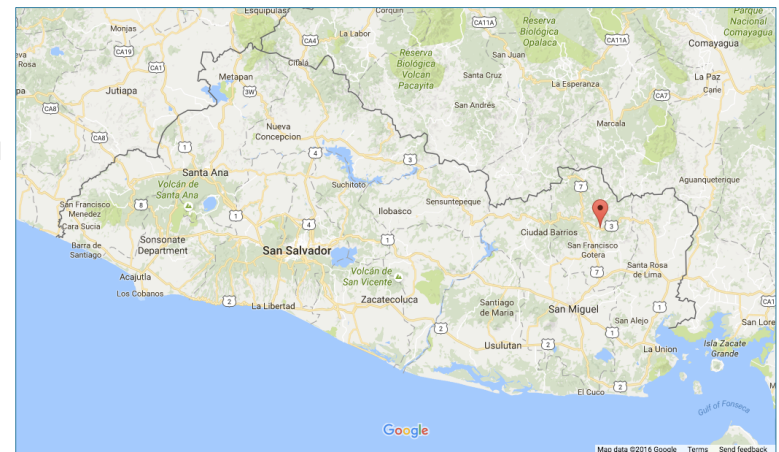


Figure 1: Map of El Salvador indicating location of Estancia.

Aims

- Determine the effects of the school-based nutritional supplementation on growth outcomes.
- Assess the overall impact of the CICDs on developmental outcomes and developmental delay.
- Compare the rates of developmental delay in specific developmental areas for children who attend CICDs and those who do not to provide a more in-depth assessment of the program.

Materials & Methods

- **Study Population:** 255 in-home surveys were conducted in eight communities in a rural area of Morazán, El Salvador. In two communities, the data was collected from families with at least one child between age 2 years to 6 years attending early child development centers. In the other six communities, surveys were conducted with families of children age 6 months to 6 years who were not attending an early child development center.
- **Survey Tools:** Surveys consisted of five sections:
 - Sociodemographic information included household size, age of children in the household, access to clean water and sanitation services, poverty proxy data, and economic data including employment history, remittances, and educational background for caregivers.
 - Dietary Intake was assessed using a 21-item Food Frequency Questionnaire (FFQ) that included the most commonly consumed foods in the region.
 - Food security data was collected using the Latin American and Caribbean Household Food Security Scale (ELCSA – *Escala Latinoamericana y del Caribe de Seguridad Alimentaria*), a series of fifteen questions assessing availability of food, quality and variety of the diet, and hunger within the family.
 - Childhood development data was collected using the Spanish Version of the Ages & Stages Questionnaire.
 - Child anthropometric data (weight, length/height)

- **Data Collection:** Interviews were conducted by AS in the presence of one of two local community health workers who have worked in the represented communities for more than ten years. Oral consent was obtained from participants and surveys were conducted over a 60-90 minute period in Spanish. To complete the Ages and Stages portion, children participated in a number of tasks and games as designated by the survey. Anthropometric data including height/length and weight were collected for each child using standard World Health Organization guidelines.



Figure 2: Typical home in the region of Estancia where data was collected.



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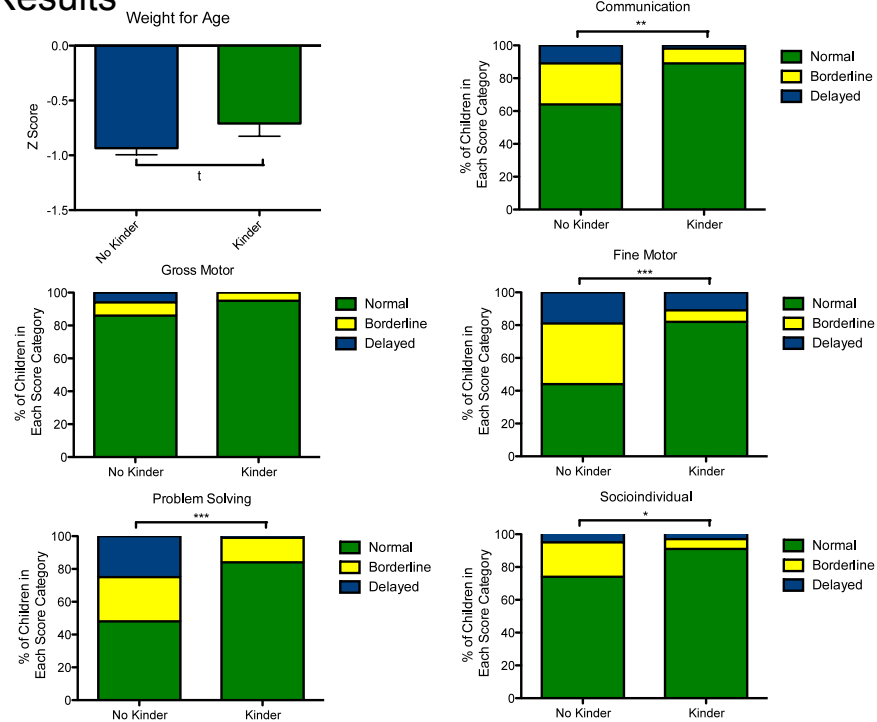
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* = < 0.05, ** = < 0.01, *** = < 0.001 Chi-Squared Test; t = non-significant trend, students t-test

Conclusions

Nutrition

- Children who attended CICDs had higher weight-for-age z-scores (i.e. they had less acute malnutrition) than their peers who did not attend.
- There was no difference in the height-for-age z-scores between children who attended CICDs and those who did not attend. CICDs have not had a significant impact on chronic undernutrition.
- These results indicate a positive impact of the school-based nutritional supplementation on child growth outcomes at the CICDs. However, the lack of impact on chronic nutrition may be due to interruptions in the program, attendance rates and other factors.

Child Development

- Children who attended CICDs had significantly lower rates of developmental delay in the following areas:
 - Communication
 - Fine Motor Skills
 - Problem-Solving Skills
 - Socio-individual
- There was no difference in the rates of developmental delay in the area of gross motor skills between children who attended the CICDs and those who did not attend.
- These results indicate a positive impact of the CICDs on 4 of the 5 areas of child development studied and suggest that CICDs may serve as a useful model for improving child development in El Salvador or similar settings.