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ROLE EXPANSION OF DIETITIANS

ELCSA, a Survey for Measuring Household Food Security, Reveals an Extremely High Prevalence of Food Insecurity in the Montaña de la Flor and Santa Maria Regions of Honduras

Amanda Lynn Chicoine, BS; Teresa M. Kemmer, PhD, RD;
Miguel Coello, MD;
Rita Maria Medina Sevilla, MPH, MSBE, RN;
Silvana Vanessa Polo Sepulveda, MPH, RN;
Rosaura Velasquez Arriaga, PM

ELCSA, the Latin American and Caribbean Household Food Security Measurement Scale, is a survey that was used to determine food security status in Santa Maria and Montaña de la Flor regions of Honduras. Households with children aged 6 to 60 months were randomly selected to participate. The food security level was determined using the positive responses to the 15 question survey: no positive responses defined food-secure, 1 to 5 defined food-insecure, 6 to 10 defined very food-insecure, and 11 to 15 defined severely food-insecure household. Within the 140 participating households, 10.7% were food-secure; 13.6% food-insecure, 22.9% very food-insecure, and 52.9% severely food-insecure households. **Key words:** *anemia*, *ELCSA*, *food insecurity*, *Honduras*, *Montaña de la Flor*, *nutrition*, *stunting*, *survey*, *underweight*, *wasting*

Author Affilliations: *Minneapolis Veterans Affairs Health Care System, Minneapolis, Minnesota (Ms Chicoine); Medical Operations, U.S. Medical Element, Joint Task Force-Bravo, Soto Cano Air Base, Comayagua, Honduras (Dr Coello); Francisco Morazán Department, Fuerzas Armadas de Honduras, Universidad de Defensa de Honduras, Tegucigalpa, M.D.C., Honduras, Central America (Ms Sevilla); Nursing Department, Roberto Suazo Cordova Hospital, La Paz, Honduras, Central America (Ms Sepulveda); and National Program of Food Security of the Ministry of Health, Region Sanitaria Departamental, La Paz, Honduras (Ms Arriaga). Dr Kemmer is an independent consultant in Wentworth, South Dakota.*

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Correspondence: *Teresa M. Kemmer, PhD, RD, 195 Lake Ridge Dr, Wentworth, SD 57075 (terikemmer@yahoo.com).*

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THE 2013 State of Food Insecurity in the World identified 842 million people who suffer from food insecurity, or about 1 in 8 people throughout the world.[1] Although there is a decline in the number of food-insecure people, the total number is still a concern.[1] At the World Food Summit, food security was defined as "when all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life."[2(p2)] Political leaders at the 1996 World Food Summit agreed that it is a fundamental right for people to have access to adequate, safe, and nutritious food.[2]

Food insecurity causes a magnitude of problems, including malnutrition, illness, conflict, and political instability. National and international agencies have identified the need for information at the household level to obtain an accurate assessment of food insecurity; however, this approach can be time-consuming and expensive. An ideal survey would be inexpensive, applicable to many areas, easy to evaluate, and reveal the situation at the household level.[3] The US Department of Agriculture has created such a survey called the Household Food Security Supplemental Module (HFSSM). This survey is intended for data collection at the household level and divides food insecurity into categories.[4] In the United States, many research studies have confirmed the validity of the HFSSM and it is considered inexpensive and user-friendly.[5-7] Other countries have adapted the HFSSM to measure food insecurity in their regions. One example of the HFSSM's use is in Ecuador where the survey has been validated.[8] Successful studies have also been conducted in Latin America, Brazil, Colombia, and the Caribbean Islands.[9-13]

Reliable measurements of food insecurity allow for a more accurate representation of the prevalence, causes, high-risk populations, and the existence of an establishment of a monitoring and evaluating system.[5] ELCSA, the Latin American and Caribbean Household Food Security Measurement Scale, is a survey for measuring household food security.[14] It was first used in 2007 in Colombia and Brazil; it is now being used in many countries in Latin America and is being translated for use in other countries.[15] The questions that make up ELCSA are based on the HFSSM.[15] Hugo Melgar-Quiñonez and researchers[15] from the University of Antioquia in Colombia, the University of Campinas in Brazil, Yale University, and the US Department of Agriculture's Economic Research Service developed ELCSA.

Located in Central America, Honduras is the second poorest country in the region. Of the 8 million people in Honduras, about 60% are affected by poverty, with 36% living in extreme poverty.[16] The infant mortality rate is 24.3%.[17] In Honduras, stunting is reported in 29%, wasting in 1%, and underweight in 8% (children younger than 5 years).[18-20] The objective of this study was to determine the prevalence of food insecurity within the remote rural Honduran villages of Montaña de la Flor and Santa Maria using the ELCSA survey.

SURVEY PROCEDURES

Participants were randomly selected from the Montaña de la Flor and Santa Maria regions in Honduras. The Honduran Ministry of Health had requested that the work be completed within these 2 regions. Maintenance of vaccination records and registration at the local public health clinic have been standard practices for all children born in these regions and were used for random selection for a minimum of 20% of children aged between 6 and 60 months. A random number table was used for generating participant selections. Only one child from each household was selected to participate. If a household had more than 1 eligible child, the study child was randomly selected by the roll of a dice.

Surveys were conducted between June 2010 and March 2012. Fluent Spanish speakers read each question to the primary care provider, and responses were recorded on the survey. This project was completed in

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collaboration with the Honduran Ministry of Health, regional health centers, and the Honduran and US military medical teams. Team members were trained to recognize the clinical signs of malnutrition and methods for measuring and assessing malnutrition. The Honduran Ministry of Health approved the study, and institutional review board approval was obtained through the university. This study was conducted according to the guidelines laid down in the Declaration of Helsinki. Consent was obtained from a primary caregiver.

Survey information collected included dietary intake, demographic, health, food security, and socioeconomic status indicators. The child's height was measured using the Infant/Child Shorrboard (Shorr Productions, Olney, Maryland). Height was obtained if the child was 2 years or older and length if the child was younger than 2 years. Height/length was measured to the nearest 0.1 cm. Weight was measured using a Seca scale (Seca; Vogel & Halke, Hamburg, Germany) and was recorded to the nearest 10th of a kilogram. *z*-Scores were calculated using the World Health Organization standards.[21] *Stunting* was defined as height-for-age *z*-score less than −2, *underweight* was defined as weight-for-age *z*-score less than −2, and *wasting* was defined as weight-for-height *z*-score less than −2. Children were referred to the local clinic for additional care if the weight-for-height *z*-score was less than −2 or if they presented with additional health issues that required referral.

The ELCSA survey was used to determine food security status. It had previously been validated in numerous countries.[12,15,22-24] Mexico, Guatemala, El Salvador, Honduras, and Nicaragua collaborated to develop a harmonized version of the ELCSA survey to use in the region.[25] In Columbia, the ELCSA survey was shown to be reliable for measuring household food security as evaluated in adult-only households in addition to adult, teen, and child households.[14] Scoring of the 15-question ELCSA survey for the prediction of severity of food insecurity was based on the number of "yes" responses.[26] A score of "0" was a food-secure household, "1-5" was food-insecure household, "6-10" was very food-insecure household, and "11-15" was severely food-insecure household.[26]

FINDINGS

A total of 145 children were evaluated. All families who were invited chose to participate; however, only 140 households responded to all ELCSA food insecurity questions. The Santa Maria region had 44 responders, and Montaña de la Flor region had 92 responders. Demographic information is shown in Table 1. The mean age of the children was 30.2 ± 12.84 months. Forty-two percent of the children were male. The prevalence of stunting, wasting, underweight, and anemia is provided in Table 2. Within the Montaña de la Flor region, the prevalence of stunting was 58.9%, underweight 38.5%, wasted 6.3%, and anemia 34.4% as compared with Santa Maria with prevalence of 67.3% stunting, 34.7% underweight, 6.1% wasted, and 36.7% anemia. There was no significant regional difference between Montaña de la Flor and Santa Maria in stunting, underweight, wasting, or anemia prevalence.

The ELCSA survey food insecurity results are shown by the region in the Figure. The total percentage of all food-insecure classifications for both regions was 89.3%. As seen in the Figure 1, the "severely food-insecure" classification exceeds all other 3 classifications combined. There were no significant differences in prevalence between regions for any of the food security categories.

The factors significantly associated with the varying levels of food insecurity are shown in Table 3. Being food insecure was associated with the child being underweight and household ownership of a telephone. The very insecure category was associated with child gender, distance from the health clinic, electricity, and the number of rooms in the house. Being severely food insecure was associated with underweight status, gender, telephone, the number of rooms in the house, receiving food assistance, and electricity. As the level of food insecurity increased, more associations

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Table 1. Parent and Child Demographic Characteristics

Variable	Mean (SD)	%
Study child gender (male)		42.1
Mean age, mo	30.2 (12.84)	
Municipality		
Santa Maria		32.9
Montaña de la Flor		67.1
The child was treated for malnutrition in past year		14.5
The child was breast-fed		98.6
Mother literate		50.4
Father literate		55.0
Mother completed primary school		60.2
Father completed primary school		52.5
Sole mother		25.5
Total in household >7 people		40.7
>1 h from clinic		48.2
Time at residence ≥3 y		80.7
At least 1 child <5-y-old died within the household		15.4
Hemoglobin	11.51 (1.56)	
Received vitamin A in the last 6 mo		75.6
Received vaccinations in the last 6 mo		77.4
Received antiparasitic medications in last 6 mo		62.9
The house had electricity		27.1
The family had a radio		74.3
The home had a refrigerator		05.7
The home had a television		08.6
The home had a telephone		48.9
The family had a vehicle		07.1
The home had an electric or gas stove		02.9
The home had brick walls		12.3
The home had a tile floor		18.0
The home had piped water		75.2
The home had ≥3 rooms		36.7
The home had a latrine (yes)		41.0
Latrine was inside home		04.3

Table 2. Prevalence of Stunted, Underweight, Wasted and Anemic Children in Santa Maria and Montaña de la Flor Regions of Honduras

Variable	<-2 *z*-Score, %	n
Stunted	62.5	140
Underweight	38.0	141
Wasted	06.4	145
Anemia	37.0	145

were noted. Using regression analysis and adjusting for gender, gender ($P = .04$) and the number of rooms in the house ($P = .035$) remained significant. When adjusting for age and gender, only the number of rooms in the house ($P = .033$) remained significant.

"Sometimes" was the most recurrent answer for each ELCSA survey question (Table 4). This means only some days did the families experience what the question was asking. An answer of "frequently" meant almost every day in the previous month families dealt with

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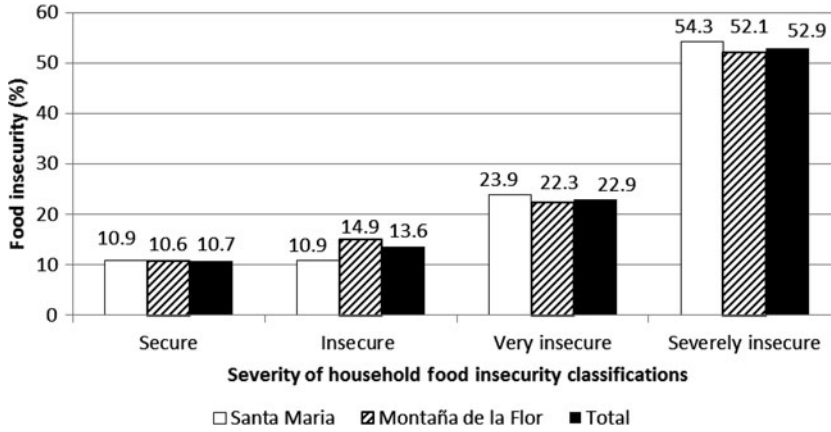

Figure 1. Prevalence of household food insecurity by region as determined by the ELCSA survey.

the issues, and "rarely" meant it only happened 1 or 2 days per month. The question with the highest percentage of a "sometimes" answer was how frequently does your child not have any food all day because of a lack of money or other resources.

DISCUSSION

Growth status and associations with food insecurity

Prevalence of stunting in children aged 6 to 60 months within the Honduran population studied was 62.5% as compared with previous Honduran studies: 51.3%,[27] 57%,[28] 57.2%,[29] and 29% reported from national studies.[18-20] The relevance of obtaining regional data reveals that the prevalence of stunting is much higher than reported nationally. Low economic status is often associated with stunting. Within a study conducted in Palestine, parents' education and employment status were significantly associated with stunting.[30] Within a previous study conducted in Honduras by Tolson et al,[29] certain home characteristics were significantly associated with stunting: mother not being able to read, father not being able to read, mother with less than 4 years of education, father with less than 4 years of education, house with fewer than 3 rooms, no electricity, and no toilet in house. In rural Honduras, socioeconomic status indicators were associated with stunting and underweight in children aged 6 to 60 months.[28]

Within families in the Kailali District of Nepal, with children aged 6 to 23 months, 69.2% were classified as food insecure. The prevalence of stunting was 41%, underweight 24%, and wasting 9%; however, there were no significant associations between household food insecurity and these growth parameters. The current study found underweight status of the child to be significantly associated with food insecurity.[31]

Table 3. Variables Significantly Associated With Food Insecurity

Variable	*P*
Food insecure	
Underweight child	.002
Telephone	.006
Very food insecure	
Gender	.040
>1 h from clinic	.004
Electricity	.003
≤3 rooms	.037
Severely food insecure	
Underweight child	.034
Gender	.040
Telephone	.018
≤3 rooms	.003
Receiving food assistance	.024
Electricity	.023

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Table 4. Prevalence of Food Insecurity by ELCSA Survey Question (1-Month Time Frame)

Variable	% Yes Responses From Total Participants	% Positive Responses From the Total Answering "Yes" to the Question		
		Frequently (Almost Every Day)	Sometimes (Only Some Days)	Rarely (1 or 2 d)
How often lack of food	72.4	43.8	46.7	09.5
How often run out of food	60	31.0	51.7	17.3
How frequently lack money	72.4	39.0	44.8	16.2
One type of food in last month	75.2	46.8	48.6	04.6
How frequently skip meal	54.5	25.3	54.4	20.3
Adult eat less than could have	67.6	30.6	59.2	10.2
How frequently adult felt hungry	57.9	29.8	54.8	15.4
How frequently adult not eat	42.1	21.3	52.5	26.2
How frequently child lack of variety	67.6	45.9	49.0	5.1
How frequently few food types	77.9	52.2	36.3	11.5
Child eat less than could have	70.3	41.2	52.9	5.9
How frequently decrease in child food	69	36.0	57.0	07.0
How frequently child hungry and unable to provide food	58.6	27.1	62.4	10.5
How frequently child to be hungry	44.8	30.8	58.5	10.7
How frequently no food for a day	29	14.3	71.4	14.3

With children aged 1 to 5 years living in Haiti in a region with 56% of the households classified as severely food insecure, 42.7% of the children were stunted, 18.3% underweight, 4.8% wasted.[26] In the current study, 52.9% of the households were classified as severely food insecure and stunting was 62.5%, underweight 38%, and wasting 6.4%.

Food insecurity measures using ELCSA

Using similar tools to measure household food insecurity is valuable when comparing results within different regions and countries. The ELCSA survey was selected for the present study since it was previously validated, was currently being used within Honduras by the Food and Agricultural Organization, and to compare current results with those previously collected within the region.

Food security was measured in Guatemala using the ELCSA survey in 2010.[32] Within this population, food insecurity prevalence was 18% mild, 17% moderate, and 47% severe. Significant associations included location of household; type of exterior, floor, and roof household material; possessions; poverty level; and services (electricity, water, and telephone).[32]

In Camp Perrin, South Haiti, ELCSA was used to determine food insecurity among 153 households with children aged 1 to 5 years. The results indicated 2% to be food secure, 17% to be food insecure, 25% to be very food insecure, and 56% to be severely food insecure.[26] The study found a significant association between severe food insecurity and having experienced malaria.[26]

The ELCSA survey also was tested in Guanajuato, Mexico, with children younger than 18 years and the level of household food security

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was 31%, mildly food insecure 37%, moderately food insecure 20%, and extremely food insecure 11%.[23] These results compared to the current study's findings of food secure at 10.7%, food insecure at 13.6%, very food insecure at 22.9%, and severely food insecure at 52.9%.

Food insecurity measured by other surveys

Although the following research presented used alternative tools to measure household food security, it is relevant to understand the various tools and the results obtained. Food security is a worldwide concern but because of the diversity in cultures, one tool may not fit all populations. Therefore, as study comparisons are made, the tools being used and the categorization of food security should be taken into consideration. However, if the tool is a valid indicator for the region in which the research was conducted, prevalence comparisons should be relatively accurate.

In rural Bangladesh, a food security survey, containing 11 questions, was conducted to gain an understanding of household food insecurity and to develop a direct measure of food security.[33] The 4 levels of food insecurity outlined were food secure and occasionally, moderately, and extremely food insecure; however, prevalence of food insecurity was not provided.[33] In the West Bank and Gaza Strip, food insecurity was reported at 62.8% and 81.7%, respectively.[30] In Ecuador, food insecurity without hunger was measured at 59.6% and with hunger was 40.4%.[8]

In a study conducted in Arctic Canada with Inuit communities, food security was assessed using an 18-item US Department of Agriculture survey that was slightly modified to fit the population better.[34] The results showed that 37.4% of the respondents were food secure, 33.6% were moderately food insecure, and 29.1% were severely food insecure. This provided an overall household food insecurity of 62.6%, compared with 89.3% in the current study. Of the households with children, younger than 18 years, 51.3% were food insecure and 21.9% were severely food insecure. The Inuit study correlated food insecurity, combining insecure and severely insecure, with household crowding, income support, public housing, single-adult household, and having a home in need of major repairs.[34] Within the current study, household crowding and single parenting were not associated with food insecurity. The Inuit study found income support associated with food insecurity where this study found an association with receiving food assistance.

In Java, Indonesia, the Radimer-Cornell tool was used to assess household food security in 1998 among 1423 mothers with children younger than 5 years.[35] The results showed household food insecurity to be 94.2%, compared with the current study's result of 89.3%. Eleven percent of the Indonesian women reported weight loss along with food insecurity.[35]

Household food insecurity in Quebec was defined by shortage of food, unsuitability of food and diet, preoccupation with access to enough food, lack of control over the food situation, and need to hide the situation.[36] Of the 98 respondents, 77% were found to be food insecure. The results also found that more than 50 of the respondent households had to modify eating patterns because of a lack of food.[36]

The Brazilian Food Insecurity Scale was used to determine household food security among 3433 children aged 0 to 60 months.[37] Food insecurity was measured at 48.6% and was higher among children whose mothers had less than 4 years of school and whose families had 3 or more children.[37] Another Brazilian study reported severe food insecurity estimated at 8.3% in 2004, with a range of 3.6% to 14.5%.[38] Significant associations in the Brazilian studies predictive model included female head of household, education level, having 3 or more children, no public water supply, rural location, and region.[38]

Within a study conducted in households of children aged 6 to 23 months living in Nepal, food insecurity was significantly associated with mothers having no formal education, no monthly income, no electricity, no toilet

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facilities, no garden, and lack of household durable assets.[31]

In Malaysia, the Radimer-Cornell Hunger and Food Insecurity Instrument was used as a measure of food security in 169 Indian women aged 19 to 49 living in Negeri Sembilan.[39] The results showed that 85.2% of the women had household food insecurity, which is very similar to that found within the current study. The Malaysia study correlated food security with more education and a lower number of children and also found associations between mean household income and income per capita with food insecurity.[39]

On the Navajo Nation in the United States, the Radimer-Cornell Hunger and Food Insecurity Instrument was also used as a measure of food security.[40] The 276 subjects were randomly selected at food stores and other community locations. Of these, 76.7% of the subjects were food insure. On the Navajo Nation, food insecurity was associated with less education, noncompletion of higher education, lower full-time employment rates, lower material style of life, food knowledge, and healthy eating self-efficacy.[40] In the current study, food insecurity was associated with underweight child, telephone ownership status, gender, distance from clinic, availability of electricity, the number of rooms in the house, and receiving food assistance.

In the United States in 1995, an estimated 11.9% of households experienced food insecurity.[41] Within these food-insecure households, 34.9% showed signs of moderate or severe hunger. Townsend et al[41] determined that food insecurity was associated with income, education, occupation, region of the country, urbanization, ethnicity, age, household size, television viewing, welfare status, and food stamps.

In Edo State, Nigeria, a cross-sectional study was conducted and food insecurity was measured using the Household Food Insecurity Access Scale.[42] Of the 416 households surveyed, 61.8% of them were classified as having food insecurity. More specifically, 7.9% of the total percentage of food-insecure population were mildly insecure, 12.8% were moderately insecure, and 41.1% were severely insecure.[42] Within the study conducted by Omuemu et al,[42] female-headed households, larger households, lower education, and lower income were associated with increased levels of food insecurity.

In Ethiopia, a sample of adolescents, aged 13 to 17 years, were asked questions relating to food insecurity.[43] Two rounds of questioning were conducted using the Jimma Longitudinal Family Survey of Youth. Food insecurity was associated with household income and sociodemographic factors. During the first round of the 1911 adolescents surveyed, 20.5% were considered food insecure. During the second round, this number increased to 48.4%.[43] Relating food insecurity to household income, it revealed that urban households were almost twice as likely to experience long-term food security if they had low- or middle-level incomes. In urban areas, one's education level was associated with food security. If the adolescents had a lower education level, then food insecurity was more likely to be seen. Having parents who were illiterate was linked to higher incidents of being food insecure for a long time. The study also found that having a female head of the household increased the chances of being food insecure to 17.5% versus 13.2% in male-headed households.[43]

In Irbid, Jordan, during a 1-year time span, women aged 18 to 70 years who came to outpatient clinics were asked to complete a food security survey.[44] Of the 500 women surveyed, 67.6% were classified as food secure and 32.4% as food insecure. Of the 32.4% who were food insecure, 43% of them were food insecure with hunger.[44]

In Indonesia, the US food security survey module was used to assess households with children younger than 5 years. Fifty-five percent of the households were rural, with 84% defined as food insecure as compared with 77% of the urban households being food insecure.[45] The rural households had less income—security, education, and access to electrical appliances than those living in urban areas.[45]

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IMPLICATIONS FOR RESEARCH AND PRACTICE

When comparing levels of food insecurity, it is beneficial to use similar tools and categories. Food insecurity within the Montaña de la Flor and Santa Maria regions in Honduras is extremely high and the benefits to combating food insecurity are substantial. The study evaluated household food security using ELCSA, the same tool currently being used by the Food and Agricultural Organization within Honduras and other Latin American and Caribbean countries. The findings of this study have been shared with the Honduran Ministry of Health and governmental and nongovernmental organizations in Honduras supporting maternal, infant, and child health and food security. The ELCSA survey should be incorporated as a standard tool to assess and compare food security in Honduras and throughout the region.

By collecting data on food-insecure areas and working with local agencies, the registered dietitian can help identify areas with the greatest need. Ensuring policy and program officials are using a validated tool throughout the region to determine national and community-level food insecurity helps compare baseline data with future evaluations. The registered dietitian can stimulate, promote, and provide program support and advocate for food-insecure populations. In addition, they can partner with national, regional, and local governmental and nongovernmental health and nutrition leaders to promote food security and to provide consultation, resources, and education to facilitate government and nongovernment programmatic solutions and guide policy.

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