

The Ability of Women to Overcome Household Food Insecurity: Social Support & Social Networks

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Abstract Food insecurity is a daily reality for millions globally and persists in rural northern Ghana. Being more a problem in resource poor countries, it challenges the wellbeing of children, adults, families and communities by creating public health problems including; low birth weight babies, mental health conditions, diabetes and obesity. This research examined associations between social networks and social support and women's ability to overcome household food insecurity. A two-phase mixed method quantitative and qualitative data collection technique was applied. A 24-item instrument was developed, pilot tested, validated and administered among women responsible for food preparation in the household (n=241). Measures of household food insecurity, socio-demographic, social network, and perceived social support were constructed and analyzed using SPSS 19®. Women in northern rural Ghana who were married, with higher social supports and social networks were more likely to experience low household food insecurity. Of 241 women, 88% were married, 39% had co-wives, 80% did not have formal education, the average age was 40 years and the average number of adults per household was 7. Correlation analysis and logistic regression models revealed social networks, perceived social support, marital status and years living in the village were significantly associated to the experience of low household food insecurity.

Keywords Public Health, Wellbeing, Food Insecurity, Perceived Social Support, Social Networks, Ghana, West Africa

and challenges the wellbeing of children, adults, families, communities and nations. Pregnant women who are malnourished are more likely to give birth to low birth weight babies. Undernourished refers to a deficiency of energy, protein intake or absorption. Malnutrition refers to a condition in which an imbalance of energy, protein, and other nutrients cause measurable adverse effects on the body¹. Children who experience food insecurity are more likely to have behavioral problems, do poorly in school, require more medical care and hospitalizations and develop chronic diseases as adults. The health related quality of life of children who live in food insecure conditions is poor². Many urban and rural households struggle to obtain food and this worsens the prevalence of food insecurity and malnutrition especially among the poor by reducing the quantity and quality of food consumed (Food and Agriculture Organization (FAO)³). Strong evidence shows that negative effects of food insecurity extend to mental health⁴. Household food insecurity is a major public health problem globally⁵ and is associated with health outcomes including; obesity⁶ and diabetes⁷. Culturally competent models that can be used to predict and understand contextual and community level behavioral factors related to food insecurity are needed to help ensure food secure households and communities.

As a daily reality for millions of people worldwide food insecurity⁸ is more of a problem in resource poor countries. The number of food insecure people globally remains high. It is estimated that 870 million people (one in eight people) globally suffered from chronic undernourishment in 2010 to 2012⁹. Food insecurity impacts health and wellbeing and interferes with the development process of a country.

There are regional differences in undernourishment. Latin America and Asia are decreasing in the number of undernourished. Sub-Saharan Africa in contrast, is continuing to have a large and rising number of those who

1. Introduction

Household food insecurity creates public health problems

are undernourished⁹. Sub-Saharan Africa also has the highest percentage of undernourished people in the world and along with the Near East and North Africa expected to suffer an increased number of undernourished people¹⁰.

The vast majority of those who are hungry – 852 million live in developing countries, where the prevalence is now estimated at 15 percent of the population⁹. In Sub-Saharan Africa there were 204 million chronically hungry people, 156 million in Asia/Pacific, 221 million in India, 142 million in China, 53 million in Latin America/Caribbean and 39 million in the Near East and North Africa.

The increased observation of disparities in food consumption by certain groups has linked food insecurity with access, vulnerability and sustainability¹¹. Although humanitarian food aid has saved lives, attention to sustainable development strategies that do not depend on the international donor community are essential if local development is to occur. In some ways, food aid has contributed to increasing destitution, vulnerability and environmental degradation¹². The receipt of food aid does not eliminate the underlying causes of food insecurity which are vulnerability and low incomes. Nor does it equip families with abilities to overcome food insecurity. Seasonal food insecurity also appears to have lasting effects that create and reinforce poverty. Social support has been found to be associated with food security, suggesting possible protection against the occurrence of seasonal household food insecurity⁵.

The specific aim of this study was to examine the ability of women to overcome household food insecurity and their usage of social networks, social support in the village of Sagnaregu located in Ghana, West Africa. The objectives were to:

- Examine household food insecurity among households in Sagnaregu, Ghana.
- Examine the association between social networks, perceived social support and household food insecurity; and
- Examine the association between certain demographic data and household food insecurity.

2. Materials and Methods

The quantitative research methods in this study were used to collect data needed to examine the relationship between the dependent variable, household food insecurity and a variety of independent variables that include; social networks, perceived social support and selected demographic variables. The methods involved using a face-to-face instrument to collect data corresponding to the study concepts (socio-demographic, social network, perceived social support and a behavioral measure of household food insecurity). Once the traditional protocol of seeking permission from local leaders was accomplished; a formal announcement to the village community regarding the study, an introduction to village leaders, a welcome to

attend a variety of community and cultural events was made. Households were then randomly selected, visited, introduced to the study and asked for verbal consent to participate in the study.

The Interview Guide

The interview guide was designed based on The Coping Strategies Index (CSI) developed in Uganda, Ghana and Kenya and used for early warning of food insecurity. The CSI measures the degree or level to which households are affected by food insecurity by measuring behavior, things people do when they cannot access enough food¹³. It is an indicator of household food insecurity that is relatively simple and quick to use. The individual household instrument used in this study was developed with the addition of qualitative data gathered in focus groups. The complete individual household instrument is six (6) pages and consists of 24 items. Expert review processes finalized the instrument and content validity was established by a focus group process.

The Duke University of North Carolina's Functional Social Support Questionnaire

The Duke University of North Carolina's Functional Social Support Questionnaire (FSSQ) was used to obtain a measure of perceived social support. The FSSQ is an eight (8) part question.

Translation of Instrument

The study population was located in a Dagomba village in Ghana and the spoken language is Dagbani. The instrument was translated into the Dagbani language and pilot tested. The translation of the Dagbani instrument was verified and approved.

Training of Interviewers

Six (6) students of the University for Development Studies located in Tamale, Ghana were employed along with one (1) University of Development Studies' professor and one village member to collect data for the study. A one-week interviewer training workshop on the survey technique and strategy to be used for this study was conducted. The training included, an introduction to the study, a review of interview techniques and principles, instruction on what to do before the interview, during the interview and after the interview, a review of the survey instrument, translation of the survey interview in Dagbani, a pilot test of the translated survey instrument and a role play experience on conducting the survey. Each interviewer role played administering the survey to one another and with family members.

Study Population

This study took place in rural Northern Ghana among the Dagomba – an ethnic group who occupy a series of villages in the region. The population of interest for this study was women who prepare food in the household and who live in the small village of Sagnaregu located in the northern region of Ghana, West Africa.

Sample Size

The sample size needed to have a reasonable chance of finding statistical significance followed the model of a study¹⁴ on food insecurity in Ghana. This study used 10% of

the village households to select a representative sample size. The total population of Sagnaregu is 13,982 and there are 2,324 households (University of Development Studies, 2011)¹⁵. Following Quaye, 2008, 10% of the number of households would be, n=232. Nine (9) additional households were surveyed over the 10% making the final sample size, n=241.

Sampling Frame

A multi stage sampling process involving a systematic sample with a random start strategy was used to select the sample for this study. Multi-stage sampling is used by the World Health Organization. This survey design has been used in the field to measure vaccination coverage and other indicators, even when a sampling frame is available. It was developed in the 1970s for immunization coverage in the USA and expanded for the smallpox eradication¹⁶.

Inclusion Criteria

Only the woman in the household, in charge of preparing the food for the household and who live in the village of Sagnaregu in the Northern region of Ghana was eligible for participation in this study.

Exclusion Criteria

Men were ineligible for participation in this study. Anyone woman in the household who was not in charge of preparing the food for the household and who did not live in the village of Sagnaregu was also ineligible for participation in this study.

Human Subjects Protection

For the purpose of human subject protection, an application was submitted to the Institutional Review Board (IRB) at Florida Agricultural and Mechanical University in Tallahassee, Florida and approval for this study was granted. In addition, IRB approval for this study was applied for and approved by the Ghana University of Development Studies and the Ghana Ministry of Health. Permission and support was also sought from the village paramount chief, elders and leaders of the women associations according to the local traditional protocol. Permission, approval and support were granted by all.

Informed Consent

Informed verbal consent was obtained from each participant.

Data Collection

This quantitative examination of women's ability to overcome household food insecurity involved the collection of primary data. A survey design was used to obtain measures of socio-demographic, social network, perceived social support and household food insecurity concepts. Once households were selected, women were visited and asked for their verbal consent to participate in the study's face-to-face interviews.

Data Analysis

Household food insecurity is the dependent variable analyzed in this study. It is examined as a dichotomous categorical variable. Socio-demographic, social network and perceived social support were utilized as independent variables. Social network, perceived social support are

categorical variables. Logistic regression models were used to examine the relationships between the variables. The data was analyzed using Statistical Package for Social Scientist (SPSS®) version 19. SPSS is one of the most widely used programs in social science. It is also used for data management and data documentation.

3. Results

Data was collected for households (n=241). To examine women's ability to overcome household food insecurity, logistic regression analyses are used to examine dichotomous dependent and independent variables. Selected variables requiring transformation were transformed to categorical variables (household food insecurity, perceived social support, social network, religion, marital status, co wives, age, number of years living in Sagnaregu, ethnicity, education, number of people currently living in the household, number of children currently living in the household, number of adults currently living in the household, number of adults who bring income into the household and income). Household food insecurity and perceived social support were recoded to low and high, religion was recoded to Islam and Other, marital status was recoded to married and not married, age was recoded to 19 – 30, 31 – 40, 41 – 50 and >50, years living in the village was recoded to 0 – 10, 11–20 and >20, ethnicity was recoded to Dagbani and Other, education was recoded to no formal and some formal, number of people in household was recoded to 0 – 6, 7 – 13 and >13, number of children in the household was recoded to 0 – 5, 6 – 10 and >10, number of adults in the household was recoded to 1 – 7 and >7, number of adults bringing income into the household was recoded to 0 – 3 and >3 and income was recoded to 0 – 25, 26 – 50, and >50. Belonging to an association (yes or no) and do you have co wives (yes or no) did not need to be transformed (Table 1).

Several logistic regression models were fitted to the data to test the research hypotheses regarding the association between the ability of women to overcome household food insecurity and perceived social support, social network, culture and certain demographic variables. Models fitted include; household food insecurity and perceived social support; household food insecurity and social networks; household food insecurity and culture; household food insecurity and socio-demographic variables (marital status, co-wives, age, years in village, ethnicity, education, number of people in household, number of children in household, number of adults in household, number of adults bringing income in the household and income) and a full model, comprising all variables. Once these models were fitted a final model was fitted to those independent variables shown to be significant during statistical analyses. The final model examined in this study is household food insecurity and perceived social support, social networks, marital status and years living in the village (Table 2).

Table 1. Selected Sample characteristics (n=241)

Transformed Variable	Measure	Freq	%
Household	Low	141	58.5
Food Insecurity	High	100	41.5
Perceived	Low	109	45.2
Social Support	High	132	54.8
	No	169	70.1
	Yes	72	29.9
Social Network	Islam	214	88.8
	Other	27	11.2
Culture Religion	Not Married	29	12.0
	Married	212	88.0
Marital Status	No	148	61.4
	Yes	93	38.6
Co-wives			
	19 – 30	65	27.0
	31 – 40	80	33.2
Age	41 - 50	52	21.6
	>50	43	17.8
Years living in village	0 – 10	77	32.0
	11 – 20	48	19.9
	>20	116	48.1
Ethnicity	Dagbani	216	89.6
	Other	25	10.4
Education	No formal	193	80.1
	Some formal	48	19.9
# of people Inhousehold	0 – 6	52	21.6
	7 – 13	93	38.6
	>13	96	39.8
# of children in household	0 – 5	144	59.8
	6 – 10	71	29.5
	10	26	10.8
#of adults in household	1 – 7	146	60.6
	7	95	39.4
# of adults bringing income	0 – 3	176	73.0
	>3	65	27.0
Income (monthly)	0 – 25	124	51.5
	26 – 50	60	24.9
	>50	57	23.7

Perceived social support (SS), social network (SN1), marital status (D1) and years living in Sagnaregu (D6) made a significant contribution to prediction (p = .001, .050, .004, .001). EXP(B) value for social support indicates that when the woman in the household has social support the odds ratio is 2.562 times as large and therefore households are 2.562 times more likely to have low household food insecurity. EXP(B) value for social network indicates that when the woman in the household is a member of a women’s association the odds ratio is 1.873 times as large and therefore household are 1.873 times more likely to have low household food insecurity. EXP (B) value for marital status indicates that when the woman in the household is married the odds ratio is 3.618 times as large and therefore households are 3.618 times more likely to have low household food insecurity. EXP(B) value for years

living in the village indicates that the longer a household has been living in the village the odds ratio is .32 times as large and therefore the households are 1 minus .32 meaning 68% less likely to have low household food insecurity. The variables utilized in the final model analysis are listed in Table 4.

Table 2. Logistic Regression Models Fitted to Data

Model 1: Perceived Social Support

$$FI = B_0 + B_1(SS)$$

Model 2: Social Network

$$FI = B_0 + B_1(SN1) + B_2(SN2)$$

Model 3: Language, Celebrations & Religion

$$FI = B_0 + B_1(Language) + B_2(Celebrations) + B_3(Religion)$$

Model 4: Demographic Variables

(Marital Status, Co wives, Age, Years living in village, Ethnicity, Education, #people living in your household, #children living in household, #adults living in household, #adults bringing income in household, income)

$$FI = B_0 + B_1(D1) + B_2(D2) + B_3(D5) + B_4(D6) + B_5(D7) + B_6(ED1) + B_7(FA1) + B_8(FA2) + B_9(FA4) + B_{10}(FA5) + B_{11}(IN1)$$

Model 5: Full Model

$$FI = B_0 + B_1(SS) + B_2(SN1) + B_3(SN2) + B_4(Language) + B_5(Celebrations) + B_6(Religion) + B_7(D1) + B_8(D2) + B_9(D5) + B_{10}(D6) + B_{11}(D7) + B_{12}(ED1) + B_{13}(FA1) + B_{14}(FA2) + B_{15}(FA4) + B_{16}(FA5) + B_{17}(IN1)$$

Model 6: Final Model

$$FI = B_0 + B_1(SS) + B_2(SN1) + B_3(D1) + B_4(D6)$$

The demographic variables in the models are explained in Table 3.

Table 3. Variable Codes for Logistic Regression Models

SS	Social Support
SN1	Social Network
B4	Language
B5	Celebrations
B6	Religion
D1	Marital Status
D2	Co wives
D5	Age
D6	Years living in village
D7	Ethnicity
ED	Education
FA1	#people living in household
FA2	#children living in household
FA4	#adults living in household
FA5	#adults bring income in household
IN	Income

Table 4. Variables in the Equation

	Beta	(SE)	df	Sig.	Exp(B)	95% CI for EXP(B)	
						Lower	Upper
SS	.941	.287	1	.001	2.562	1.459	4.498
SN1	.628	.320	1	.050	1.873	.999	3.510
D1	1.286	.452	1	.004	3.618	1.491	8.778
D6	1.135		1	.001	.321	.165	.628
Constant		.316	1	.002	.372		

4. Conclusion

The primary result of this study is that in this village, Sagnaregu located in the northern region of Ghana, measures of social networks, perceived social support, marital status and years living in the village were found to be related to women's ability to overcome household food insecurity. Strengths of this study are the random sample and the ethnographic data gathered to construct a context specific and validated instrument. This study makes a key contribution to our understanding of how women in rural and resource poor countries can overcome household food insecurity. This study also provides a model for examining household food insecurity in small and rural communities. The limitation of this study is that the Coping Strategies Index instrument measures short term strategies and it predicts current household food insecurity status. Therefore, these results cannot be used to predict future household food security status. Another limitation to consider is that the household food insecurity scale used in this study is a relative and not an absolute measure. It cannot distinguish between pre-crisis and crisis driven coping strategies.

To the best of our knowledge this article is the first report of a relationship of a measure of household food insecurity and social networks, perceived social support, marital status and years of residence in the rural, northern region of Ghana, West Africa. The contextual data used to develop the instrument has been reported as essential to designing strategies for addressing household food insecurity. The deeper ethnographic data obtained is valuable when considering social determinants of health that may be connected to household food insecurity.

As Ghana strives to achieve a middle income status, the Millennium Development goal to half hunger and poverty by 2015, is important. Income was not significant in this study; however, food insecurity and poverty are interrelated. Over 1 billion people live in extreme poverty and two thirds of them are women. With the escalating problem of climate change it is possible that poverty will increase due to factors that will inhibit women's ability to produce food. The voice of women is required in order to respond to specific challenges faced by women especially with the different way women are affected by climate change than men. The responsibility of women for feeding their families depends on natural resources such as land, wood and water and they have limited access. With limited access to loans, education and information, a women's potential as agents of change for climate mitigation and adaptation remains untapped. Assessment of food insecurity is conducted in Africa by the World Food Program and other specialized nongovernmental organizations. This study's examination of contextual specific measures of food insecurity was useful in examining the nature of household food insecurity. The results provide a framework for public health intervention that is cost effective and context specific. The results of this study highlight public health implication. The identification of critical areas of approach; including the amount of time a person lives in a village, marital status, social networks and

perceived social networks provides avenues of public health intervention. It is recommended that responsive policies that provide resources for public health intervention are needed. Public health intervention should include expanded education, capacity, collaboration and partnership as strategies of approach especially for female supported families.

Household food insecurity is an increasing global public health concern. The global disparities and the regional disparities in Ghana West Africa threaten development and wellbeing. Ghana's northern rural areas are reported to have higher rates of household food insecurity, fewer resources and lower educational levels. The results of this study suggest that the greater levels of social networks, perceived social support and years living in the village and marital status lead to lower levels of food insecurity. Implications of the findings of this study offer possible approaches to help families overcome household food insecurity.

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