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Household Food Insecurity and Health among African American Women in Black Belt Counties of Alabama: Evidence from Mixed-Methods Research

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Abstract

Background: African Americans are more vulnerable to food insecurity than the American population overall. In Alabama's Black Belt, food insecurity is more than three times the national average level. Yet, little is known about the association between food insecurity and health among African American women in the region. The purpose of this study is to assess the relationship between food insecurity and health among African American low income mothers in Alabama's Black Belt.

Method: We conducted qualitative and quantitative research among 220 low-income African American mothers in a five-county area of Alabama's Black Belt region that included Bullock, Dallas, Lowndes, Macon and Wilcox counties. Household food insecurity was measured with the United States Department of Agriculture Household Food Security Survey Module. Bivariate and multiple regression analysis were used to estimate the association between household food insecurity and health status.

Results: Over 51% of the mothers and their children live in food insecure households. We present qualitative and quantitative evidence that food insecurity is significantly associated with self-rated health. The mothers living in food insecure household are more likely to report poor general health. Nearly one-fifth of the women interviewed complained of health problems, including high blood pressure, back pain, depression and asthma.

Conclusion: The association of food insecurity with health, regardless of causal direction, shows the precarious situations poor single mothers in rural areas face. Reducing food insecurity among these mothers may improve their health status. The future direction of food insecurity research must go beyond just monitoring food insecurity to linking it with medical related out outcomes including health status.

Keywords: Food insecurity; Self-rated health; African Americans; Black belt region; Alabama

Introduction

Food insecurity is defined as "limited or uncertain availability of nutritionally adequate and safe foods, or limited or uncertain ability to acquire food in socially acceptable ways" [1,2]. Food Insecurity continues to affect millions of American families differentially; indeed, African American and Hispanic families are more likely to be vulnerable to food insecurity [2]. Data published by Zekeri and Diabate [3] indicated that the prevalence of food insecurity in Alabama's Black Belt was more than three times the national average level.

The purpose of the present study is to assess the prevalence and the relationship between food insecurity and health status in the Alabama Black Belt where poverty is high and the educational level is low. The central hypothesis guiding this analysis is that food insecurity among poor mothers is associated with their health status. This is suggested because food insecurity is embedded within the context of poverty which is likely to produce anxiety and fear that may take a toll on health. Also, the deprivation of basic needs represented by food insecurity is a possible precursor to suboptimal dietary intakes that may compromise health. Food insecurity may also impact health by competing demands between food and health care expenditures and decreases adherence to medications that should be taken with food.

Several studies have examined the impact of food insufficiency as measured by a scale derived from the National Health and Nutrition Examination Survey III on health status among adults in urban areas [4-15]. In these urban studies, self-rated health status is associated with food insufficiency. However, reports of the relationship between household food insecurity and health in rural areas are limited. Despite its potential impact on health and well-being, surprisingly little research has been done on the relationship between household food insecurity and health among poor families in rural Alabama's Black Belt Counties. Therefore, as an extension of previous research [2,3,11,12,16,17], the goal of this present study is to examine the prevalence and the association between food insecurity and health status in a poverty-stricken region of Alabama.

Methods

Our qualitative and quantitative analyses rely on data from of an ongoing large project, Food Insecurity in Poor, Female-Headed Families in Five of Alabama's Black Belt Counties which entailed 220 in-depth, qualitative interviews of African American female-headed families in Alabama Black Belt region. The sample was drawn from a list of 500 families in a five-county area of Alabama's Black Belt that included Bullock, Dallas, Lowndes, Macon, and Wilcox counties. The families were classified as food-insecure using the United States Department of Agriculture (USDA) food insecurity scale that included six questions about behavior and experiences of households under pressure to meet their food needs [1-3,16-19].

Research Setting

Alabama's Black Belt, is a region that is part of the greater Black Belt region of the United States, that is characterized by a predominantly black population with high poverty rates and heavy dependence on welfare programs. Given the spatial concentration of poverty, poor people in Alabama's Black Belt have rundown neighbourhoods, and the area has a low tax base to finance public schools and a shrinking number of businesses [1,18,19]. Low-in-come households are dispersed throughout the open country and its isolated hamlets. It is one of the poorest regions in the nation and majority of the residents are welfare dependent. The residents are, as the President's National Advisory Commission on Rural Poverty put it in 1967, "people left behind." It is also one of those categorized by the United States Department of Agriculture as counties of "persistent poverty."

Measurement of Health Status

Health status is the dependent variable. The measure used is Self-rated health (SRH) which is the most widely used validated, single-item indicator of health across social research [20-22]. Self-rated health is one of the most commonly used subjective measures one will find in the literature in economics as well as in epidemiology [20-22] and it predicts mortality and morbidity. Single mothers were asked to rate their overall health at the time of the of the survey with a standard five-category item for self-rated health, with values ranging from excellent (1) to poor (5). Self-rated health has been shown to be a reliable, valid measure of health, and it is predictive of subsequent functional decline [20,22]. It is a valid and reliable measure of general physical well-being [20-22]. It combines the subjective experience of acute and chronic, fatal and nonfatal diseases, along with general feelings of well-being. It also predicts mortality net of chronic and acute diseases, physician assessments made by clinical exam, physical disability, and health behaviors [21,22].

Key Independent Variable of Interest: Food Insecurity

The independent variable of greatest interest is food insecurity. We collected questionnaire data in face-to-face, in-home, structured interviews with black mothers who were heads of the household. The interviews lasted about 90 min. Food insecurity was measured using a structured questionnaire (based on the USDA's Food Security Core Module) as in past studies [1-3,17]. Participants were classified as food secure or insecure using the USDA Food Insecurity Scale. This questionnaire comprises six questions about behavior and experiences of households under pressure to meet their food needs [1,2,16]. Using the USDA validated cut points, African American woman whose summed scores were ≤ 1 were classified as food secure and those who scored between 2 and 6 were classified as food insecure. African American mothers were advised that each person would receive a $15.00 prepaid debit card from Wal-Mart store as an incentive for participating in the study. All study procedures were reviewed and approved by the Tuskegee University Office of Research Compliance prior to the collection of any data (HPRC No. 022605).

Control Variables

We selected control variables based on prior literature on factors associated food insecurity and health outcomes [2,4,7-14,16]. Variables used in the study included age (continuous), educational attainment (<high school, high school, >high school), work status (1=full-/part-time jobs, 0=not employed) and annual household income. Those who were participating in or receiving Supplemental Nutrition Assistance Program (SNAP) benefits (formerly known as the Food Stamp Program) was coded as 1 at the time of interview. Taken together, these sociodemographic and work characteristics provide a basic outline of the respondent's social position.

Data Analysis

The analysis employs bivariate multiple regression methods using SPSS 24.0. First, health is regressed on food insecurity to determine any statistically significant associations. Then, an expanded form of regression analysis examines effect estimates (regression coefficients) of food insecurity and the control variables on health status.

The estimated model is stated as:

$$HTS = \beta 0 + \beta 1FIN + \beta 2INC + \beta 3EPS + \beta 4EDU + \beta 5PSN + \varepsilon$$

Where

HTS=Health Status

FIN=Food Insecurity

INC=Household Income

EPS=Employment Status

EDU=Education

PSN=Participate in SNAP

β=Coefficient

ε=Error Term

We assessed multicollinearity using Variance Inflation Factors (VIF), which were all <4, indicating that multicollinearity was not complicating our analyses.

Results

Quantitative results

Socio-demographic characteristics of the study participants

A total of 220 African American mothers were involved in the study. Of these mothers, 45.8% reported poor to fair health status (Table 1). The majority (51.5%) were classified as food insecure. Regarding household income, 52.2% earned less than $19,999. More than half (60.3%) were unemployed and 61.5% were participating in the Supplementary Nutrition Assistance Program.

	Percent
Health Status	
Poor	10.3
Fair	35.5
Very Good	30.4
Excellent	10.1
Mean age in years	45.1
Food Insecurity	
Food Secure	48.5
Food Insecure	51.5
Education	
< High school graduate	37.5
High school graduate	50.4
Some college	12.1
College graduate and/or postgraduate degree	
Family Income (yearly)	
Under $19,999	52.2
$20,000 to $74,0000	48.5
Employed (including part-time)	60.3
Unemployed	36.5
Participating in Supplementary Nutrition Assistance Program	
Yes	61.5

Table 1: Demographic characteristics of study participants (N=220), Values may not add to 100% because of small amounts missing data are not reported.

Bivariate regression analysis result shown in Table 2 indicated a statistically significant association between food insecurity and health status. This finding is consistent with some previous research [4,8,9,11-14] that found that the association between food insecurity and health status is statistically significant.

	Self-Rated Health Status	
	Model 1	Model 2
Food insecurity	-0.112*	-0.147*
Age		0.035
Income		0.019
Full-time employment		0.237*
Education attainment		0.161*
SNAP		0.085
Adjusted R2	0.038	0.14

Table 2: Standardized coefficients of regression analyses of predictors of health status, *p<.05.

Multivariate analysis

Table 2 presents the results from regression analysis predicting self-rated health. Furthermore, and confirming some previous studies [11-15], model 2 in Table 2 indicated that among the predictor variables, food insecurity is still statistically associated with health status. Model 2 demonstrates that educational attainment and employment have large and statistically significant relationships to general health. Having a four-year college degree and being gainfully employed are related to better self-reported health. Thus, consistent with previous literature [6,11-14,16], higher levels of education and employment are associated with more health-optimistic rating. Income, in contrast, is unrelated to ratings net of other variables. Taken together, the results provided support for the hypothesis: Food insecurity is statistically associated with health status.

Qualitative Results

Food insecurity

Households that report three or more conditions that indicate food insecurity are classified as "food insecure." That is, they were at times unable to acquire adequate food for one or more household members because they had insufficient money and other resources for food.

Fifty-eight percent of our mothers said they “worried whether their food would run out before they got money to buy more.”

Of the working mothers we interviewed, 45 percent indicated that the “food they bought didn't last, and they didn't have money to get more” and 41 percent said that they “couldn't afford to eat balanced meals.” One mother told us that, “Food is always a problem, since bills consume most of cash income. I have lost about fifty pounds in the last five months.”

Food insecurity in households including children age 0-17

Most mothers who ran out of food, however, were not able to shield their children from food hardship. Along with financial risks these mothers faced, they also worried about putting their children in jeopardy because they could not provide adequate food. The mothers we interviewed viewed lack of food as especially detrimental to their children. Among mothers with children ages 0 to 17, for example:

Forty-two percent admitted that "we could not feed our children a balanced meal, because we could not afford that." One mother commented that "my children were not eating enough because we just could not afford enough food." Several mothers told us that in the last 12 months, they cut the size of the children's meals because there was not enough money for food.” Some mothers with who we spoke seldom feed their children well. Thirty-eight percent said, “in the last 12 months, some of the children skipped meals because there was not enough money for food.” Sickness was a major problem in these households because of lack of food. As any parent of young children knows, children who go without adequate food are exposed to more diseases than children who are well fed. Many women told us that their children were sickly or had emotional problems because there is no

adequate food in the house. Parents whose children have serious or chronic health problems must attend to a variety of needs, such as multiple doctor appointments, or meeting with school officials.

Medical problem

More than one-half of the mothers said they had needed to see a doctor but could not afford it. One out of four of the African American mothers had no health insurance for their children and themselves. This made mothers feel that their health situations were precarious. One mother said,

I do not have any insurance. I had asthma. Some doctors want their payment right away, so I do not go to see them. I just got done paying one of my doctor bills off.

Poor health

Nearly one-fifth of the women interviewed complained of health problems, including high blood pressure, back pain, depression and asthma. Thus, health concerns interfered with their ability to work or keep a job. During the interviews and focus group meetings, the food insecure mothers indicated that they are in poor health. They are nearly three times as likely as other mothers to report to have poor or fair health. Many mothers said that their children were sickly or had emotional problems. We met many mothers with poor health, special needs, or disabilities.

Discussion

In this Quantitative and qualitative study we assessed whether household food insecurity is associated with health status. Similar to other studies, we found that food insecurity is significantly associated with self-rated health. The association remained statistically significant after controlling for potentially cofounding factors, a finding that supports past evidence [8-14]. In a random sample of 724 single women, who were welfare recipients in northern Michigan, Siefert et al. [11] found that food insufficiency was significantly associated with poor or fair self-reported health. This study advances our knowledge of this relationship by focusing on the link between food insecurity and self-rated health in rural Alabama where access to health treatment can be even more difficult to obtain than in urban areas. Moreover, the majority of the previous studies used a single item measure of food insufficiency, while our study used the U.S. Food Security Module scale to measure food insecurity allowing researchers to be more confident in the reliability and validity of the findings [4,5,11-13].

In sum, the association of food insecurity with self-reported health, regardless of causal direction, shows the precarious situations single mothers in rural areas face. Beyond food problems, these mothers struggle with health problems. The findings highlight the need to prevent food insecurity and ensure that all rural people are adequately fed to improve their health and social well-being. The production of health is clearly very complex, but we argue that food insecurity can have a meaningful impact on well-being, along with other factors considered here and a multitude of unmeasured influences. In poor rural areas such as Alabama's Black Belt, a number of obstacles to health care and health care access could also contribute to poor health status. Alabama's Black Belt faces a unique combination of factors that create disparities in health care not found in urban communities such as economic factors, cultural differences, and educational attainment.

Policymakers must recognize that food program participation did not reduce food insecurity for the families in this rural region of this study. More research is needed to understand why this is so. The future direction of food insecurity research must go beyond just monitoring food insecurity to linking it with medical related out outcomes including health status. Longitudinal studies with more measure of food insecurity are needed to better understand the relationships between food insecurity and health outcomes and to inform specific program interventions to reduce health disparity in the rural south.

Limitations

The study is subject to several important limitations. First, the cross-sectional nature of the design makes it impossible to draw cause and effect inferences from the study. For example, it is possible that poor health outcomes contribute to food insecurity. Further tests of the model should utilize longitudinal data, including a more comprehensive measure of household food insecurity to ascertain the true nature of the associations reported here.

Additionally, our reliance on self-reported health rather than formal diagnosis based upon structured medical interview may be seen as another limitation. Clearly, the ideal study would include screening with objective measure of health followed up with a structured clinical interview. The significance of self-reported health, however, should not be underestimated [20-22]. Research examining food insecurity in relation to objective measure of health in other regions is required to confirm our findings.

Finally, despite the finding of statistically significant associations in this study, none of the variables examined was a powerful predictor of self-rated health; the variation in performance accounted for by these factors remained low. Such a finding suggests that it may be important to consider other types of explanatory variables. Perhaps it will be useful if further research focuses on other variables not included in our model.

Acknowledgement

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Conflict of Interest

The authors have no conflict of interest.

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