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Household Food Insecurity and Perceptions of Health Status among Single Mothers in Rural Alabama Living With HIV/AIDS on Antiretroviral Therapy.

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ABSTRACT

Background:Household Food insecurity continues to affect millions of American families and it is also recognized as a public health issue for both developed and developing countries. For the past twenty years, food insecurity has become a recognized problem among people living with HIV/AIDS in North America and Africa. Studies have shown that food insecurity is highly prevalent among HIV-positive individuals in North America, and can compromise adherence to therapy and mortality. However, no study has examined the prevalence of food insecurity among HIV-infected individuals living in poor rural areas of Alabama. Thus, as an extension of my previous research, the purpose of this current study is to examine the impact of household food insecurity on self-reported health status in sample of single mothers living with HIV.

Methods: Single mothers were interviewed two times during a one-year-period (January-December, 2020). The interviews were to help determine how food insecure single mothers provide the daily necessities of life for themselves and their children and make ends meet. The interviews took place in respondents' homes, providing opportunities to observe gardens, food storage facilities, and the general living conditions. The interviews consisted of a quantitative measure of self-reported health status, depression (using the Center of Epidemiological Studies on Depression Scale or CES-D), and food insecurity. All study procedures were reviewed and approved by the Tuskegee University Office of Research Compliance prior to the collection of any data. Data were analyzed using correlation and multiple regression analyses.

Results: Using the USDA's Food Security Scale, 36% (108) of the single mothers were classified as food insecure and 38% (114) reported poor to fair health status. Majority, 66% (198) were African-Americans and 33% (99) did not complete high school. Regarding household income, 50.2% (156) earned less than $10,000. More than a third, 36.5% (110) were unemployed and 47% (141) were between the ages of 18 and 44. The bivariate correlations and regression analysis indicated that household food insecurity, education, employment status and depressive symptoms were significantly related to health status.

Conclusions: An important finding in this study is that food insecurity had influence on health status. Household food insecurity is a serious public health problem because it is so tightly linked to adverse health outcomes. The negative implications for health are greatest for mothers living in severely food-insecure households. Household food insecurity puts mothers at greater risk of developing serious chronic conditions.

Keywords: Household food insecurity, HIV/AIDS, employment status, depressive symptoms, Health status, Alabama Black Belt.

1. Introduction

Household Food insecurity, defined as the "limited or uncertain availability of nutritionally adequate and safe foods, or uncertain ability to acquire food in socially acceptable ways" continues to affect millions of American families and it is also recognized as public health issue for both developed and developing countries[3-5] For the past twenty years, food insecurity has become a recognized problem among people living with HIV/AIDS in North America and Africa[1-5] . Studies have shown that food insecurity is highly prevalent among HIV-positive individuals in North America, and can compromise adherence to therapy and mortality in urban areas [1-5] However, no study has examined the prevalence of food insecurity among HIV-infected individuals living in poor rural areas. Therefore, the primary purpose of this study is to examine the prevalence of and factors associated with food insecurity among a sample of rural poor HIV-infected mothers in Alabama's Black Belt.

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 [5-10,12.] Other studies suggested that food insecurity was associated with poor self-rated health status[6-9. 11,13-15.] However, these studies are concentrated in urban populations and reports of the effect of household food insecurity on perceptions of health status in rural areas with high African American population are limited. Despite the fact that food insecurity could be a significant source of stress and impact health and well-being, surprisingly little research has been conducted on the effect of household food insecurity on health status among poor single mothers living with HIV in the rural south where food insecurity is prevalent [1-5].

Thus, as an extension of previous research[1-5,12-14.] the purpose of this study is to examine the impact of household food insecurity on self-reported health status after controlling for several variables that may simultaneously affect health status in sample of single mothers in lower socioeconomic positions.

2. Material And Methods

2.1 THE RESEARCH SETTING

This research was conducted in an area called the "Black Belt", in state of Alabama. Black Belt as used in this study is a demographic characterization. This area of the United States has high concentration of poverty, high unemployment, and poor access to medical facilities and education. [1,2,3.4] African Americans make up the largest proportion of the population in the region. Because of the spatial concentration of poverty, the poor in Alabama's Black Belt have poor neighborhoods, and the area has a low tax base to finance public schools, health facilities, and businesses [5]. Low-income households are dispersed throughout the open country and its isolated hamlets. Persons with limited financial resources who live in these places risk not having access to affordable and nutritious foods. In fact, poverty is higher in the Black Belt than in other populations in Alabama and the United States [1-5].

2.2 THE STUDY

This study was conducted in 2020 as part of a larger longitudinal project, Food Insecurity in Poor, Female-Headed Families in five counties within Alabama. Previous analyses from the same population[3-4] focused on food insecurity, depression, and livelihood strategies among single mothers. The focus of the present investigation is on the effect of food insecurity on self-reported health status. The sample for the present analysis, 300 single mothers that are heads of their families, was drawn from a list of 1,000 families in a five county area that included Bullock, Dallas, Lowndes, Macon, and Wilcox counties (Black Belt Counties). The sampling plan called for a sample of 60 single mothers from each county.

2.3 DATA COLLECTION

Single mothers were interviewed two times during a one-year-period (January-December, 2020). The interviews were to help determine how food insecure single mothers provide the daily necessities of life for themselves and their children and make ends meet. The interviews took place in respondents' homes, providing opportunities to observe gardens, food storage facilities, and the general living conditions. The interviews consisted of a quantitative measure of self-reported health status, depression (using the Center of Epidemiological Studies on Depression Scale or CES-D), and food insecurity. Prior to obtaining informed consent, the purpose, procedures, risks and benefits of the study were explained. Single mothers were also advised that each respondent would receive a $15.00 prepaid debit card 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.

2.4 MEASURES OF VARIABLES

Self-reported health is the dependent variable. A global assessment of physical health was measured using respondents' self-reports of their health [17, 18]. Single mothers were asked to rate their overall health (excellent, very good, good, fair, or poor) at the time of the survey. Self-rated health has been shown to be a reliable, valid measure of health, generally stable over time, served an accurate measure of physical health status and it is predictive of subsequent functional decline[17, 18]. It is a

valid and reliable measure of general physical well-being. It predicts mortality net of chronic and acute disease, physician assessment made by clinical exam, physical disability, and health behaviors [17].

Food Insecurity - Single mothers were classified as food insecure using the USDA Food Insecurity Scale that included six questions about behavior and experiences of households under pressure to meet their food needs [4-5]. Questions were asked about the household's experience during the past twelve months. Specifically, respondents were asked:

Q1.The food that I/we bought just didn't last, and I/we didn't have money to get more (often true, sometimes true = 1; never true = 0)

Q2. I/we couldn't afford to eat balanced meals. (often true, sometimes true = 1; never true = 0).

Q3. In the last 12 months did you and/or other adults in your household ever cut the size of your meals or skip meals because there wasn't enough money for food? (yes = 1; no = 0)

Q4.If yes, how often did this happen? (Almost every month, some months but not every month = 1; for only 1 or 2 months = 0).

Q5. If yes, in the last 12 months, did you ever eat less than you felt you should have because there wasn't enough money to buy food? (yes = 1; no = 0)

Q6. If yes, in the last 12 months, were you ever hungry but didn't eat because you couldn't afford enough food? (yes = 1; no = 0). Respondents who answered "yes" to one or none of the items were classified food secure and those who marked "yes" to two to six items were classified food insecure.

Other variables found in previous research to affect health status were, indicators of respondent's age, race (Black or White), educational attainment (years of completed schooling), employment status, and annual income [4-6, 8,12-13]. These were included in the multiple linear regression model. Household income (in dollars), and age of single mothers (in years) were included as continuous variables. Race is a dummy variable coded 1 for African Americans, 0 for white. Education level was a dummy variable coded 1 for those with four year college degree, 0 otherwise. Employment status is also a dummy variable coded 1 if the single mother is unemployed, 0 if employed. Taken together, these sociodemographic and work characteristics provide a basic outline of the respondent's social status.

Depressive symptoms (the Center for Epidemiologic Studies -Depression Scale (CES-D) is also known to affect health status from previous research. The CES-D is a well-known and widely used self-reporting instrument for assessing depression symptoms in the general population without the bias of an administrator affecting the results (Radloff 1977). It has been used successfully for many years in the primary care setting. CES-D consists of 20 items that cover affective, psychological, and somatic symptoms. The CES-D was created as a brief self-report scale designed to measure symptoms associated with depression experienced in the past week. The CES-D targets 6 major facets of depression: depressed mood, feelings of guilt and worthlessness, feelings of helplessness and hopelessness, psychomotor delay, loss of appetite, and sleep disturbance.

2.5 STATISTICAL ANALYSIS

In order to address the purpose of the research, the analysis employed multiple linear regression analysis. Multiple regression analysis was conducted using the SPSS software version 14 (SPSS Inc, Chicago, Illinois) for Windows (Microsoft Corp, Redmond, Washington) to examine the effects of household food insecurity controlling for, demographic characteristics, economic risk factors, and depressive symptoms on health status. Variance Inflation Factor (VIF) scores for all of the independent variables were under 6.0, suggesting little multicollinearity among the variables. A significance level of 0.05 was used for all analyses [17].

3. Results

Using the USDA's Food Security Scale, 36% (108) of the single mothers were classified as food insecure and 38% (114) reported poor to fair health status (Table 1). Majority, 66% (198) were African-Americans and 33% (99) did not complete high school. Regarding household income, 50.2% (156) earned less than $10,000. More than a third, 36.5% (110) were unemployed and 47% (141) were between the ages of 18 and 44.

Table 1: Food Insecurity, Demographic Characteristics, Economic Risk Factors, and Psychological Component of Food Insecurity (N=300)

Variables	Percent
Health Status	
Poor	8.3
Fair	29.0
Good	18.5
Very Good	29.6
Excellent	7.9
Household Food Insecurity	
Food Secure	64.0
Food Insecure	36.0
Demographic characteristics	
Age, years	
18-44	47.0
45-64	14.1
65 and above	35.6
Race	
African American	65.5
Hispanic	34.5
Educational Attainment	
Did not complete high school	32.5
Completed high school or equivalent	33.7
Some college of post high school training	24.5
Completed a college degree	9.3
Economic risk factors	
Annual household Income	
Under $10,000	50.5
$10,000 to $14,0000	49.5
Employment Status	
Employed (including part-time)	60.5
Unemployed	36.5
Psychological Components of Food Insecurity	
Felt depressed	64.8
Sadness	61.2
Restless sleep	55.7

a. Some percentage scores do not sum to 100% because missing data are not reported.

Results of the bivariate and multiple regression analysis are presented in Table 2. The bivariate correlations between the dependent variable and independent variables indicated that household food insecurity, education, employment status and depressive symptoms were significantly related to health status.

Table 2: Bivariate and Multiple Regression Equation for Self-Rated Health Status (N=300)

Variables			Multiple Regression		
	Bivariate	b-value	S.E.	Beta	Sr
			r		
Household food security	-.306***	-.095	.041	-.170*	.03
Demographic characteristics					
Race[a](Black=1)	.043	.045	.040	.078	
Education (Four-year college degree)	.236*	.034	.044	.058	
Economic risk factors					
Employment					
Employed full-time	.-307**	-.059	.024	-.160*	.03
Depressive Symptoms	-.402***	.008	.002	-.283**	.08
Multiple R		.482***			
R^2		.232			
Adjusted R^2		.209			
F		9.92***			

***p <.05; **P<.01; ***P<.001**

The multiple regression results revealed that three of the five independent variables, household food insecurity, employment status and depressive symptoms were significant predictors of health status. The squared semipartial correlations indicated that food insecurity (Sr^2 = .03) and employment status (Sr^2 = .03) had similar impacts on health status whereas, depressive symptoms had better impact (Sr^2 = .08). Both food insecurity and employment status accounted for 3% each of the variance in health status while depressive symptoms uniquely predicted about 8% of the variance in health status when food insecurity, race, education, and employment status were statistically controlled. This impact of depressive symptoms is more than twice that of food insecurity (Sr^2 = .03) and employment (Sr^2 = .03).

Overall, the model explained 21 % of the variance in health status (R = .48, R^2 =.23, and adjusted R^2 =.21, F (5,164) = 9.92, P <.001).

4. Discussion:

This research examined the impact of food insecurity on self-reported health status in a sample of single mothers from rural Alabama. Based on the USDA's Food security Scale, 36% of the respondents were classified as food insecure. The prevalence of food insecurity in this sample contrasts sharply with the most recent national figure, where about 15% of the United States households were food insecure.

Regarding the purpose of the study, household food insecurity had a modest impact on self-rated health status. Depressive symptoms had more than twice the influence of food insecurity and employment self-rated heath status. These findings are consistent with some previous research in urban areas[12-15].

An important finding in this study is that food insecurity had influence on health status. This suggests that food insecurity goes beyond a psychological state and may reflect food deprivation. Thus, diet should be an important consideration in the health of these women and should receive attention from medical professionals and policy makers.

Food insecurity has serious implications for people's health and wellbeing beyond just poor nutrition and diet. And as a result, it can take a serious toll on health care resources and spending. Household food insecurity can be a serious public health problem because it is so tightly linked to adverse health outcomes, above and beyond the influence of other social determinants of health.

This current study in a rural Southern region of America advances our knowledge of the impact of food insecurity on health status by focusing on communities where access to health treatment can be even more difficult to obtain. Moreover, the majority of the previous studies used a single item measure of food insufficiency while the current 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.

The negative implications for health are greatest for those mothers living in severely food-insecure households. Household Food insecurity also makes it difficult for mothers to manage existing health problems and it can lead to worsening conditions. Food-insecure mothers may

struggle to adhere to therapeutic diets and forgo necessary medications [17].

Conclusion:

In sum, the influence food insecurity and depressive symptoms on self-reported health gave insights into the precarious situations poor single mothers in rural areas face despite the general prosperity of the United States. The negative implications for health are greatest for those living in severely food-insecure households. Beyond food problems, these poor single mothers struggle with mental and overall health problems. Women living in food-insecure households are more likely to experience poor health, and chronic conditions, like depression and anxiety disorders. The findings highlight the need to prevent or at least reduce food insecurity and ensure that rural residents are adequately fed to improve their health and social well-being. Poverty in the research setting impacts all aspects of life, from obtaining the basic necessities of life, including food and shelter to accessing the luxury of health care. Health professionals and policy makers must develop more effective programs for alleviating causes of household food insecurity in the 21st century because of the contribution of this stressor to adverse health outcomes.

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 among single mothers from a variety of racial/ethnic groups.

Limitations of the study

The study has some limitations. First, the cross-sectional nature of the data makes it impossible to infer causal relationships between variables. Further tests of the model should utilize longitudinal data, including a more comprehensive measure of household food insecurity and health to ascertain the true nature of the influence reported here. Reliance on self-reported health rather than formal diagnosis based upon structured medical interview may be seen as another limitation. The results are subject to recall and report bias. Clearly, the ideal study would include screening with self-reported measure of health followed with a structured clinical interview. Finally, in order to establish generalizability of the results, the study should be replicated in other geographic locations. Findings of these follow-up studies would help us identify which finding can be applied to which populations.

Conflict of Interest: The author reports no conflict of interest in this work.

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