

Food Insecurity, Poor Diet Quality, and Obesity among Food Pantry Participants in Hartford, CT

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ABSTRACT

Objective: Examine relationships between food security, diet quality, and body mass index (BMI) among food pantry users.

Methods: Convenience sample of 212 food pantry clients in Hartford, CT from June, 2010 to May, 2011. Main outcomes included food security (United States Department of Agriculture module), fruit and vegetable consumption (Block Screener), and BMI (stadiometer and digital medical scale). Chi-square tests, Spearman correlations, and logistic regression models were analyzed.

Results: Over half of the sample (50.5%) had very low food security. Mean BMI was 29.5 kg/m². Age was positively associated with food security ($P < .01$). Food-secure participants were twice as likely to eat fruit, vegetables, and fiber as food-insecure participants ($P = .04$). Women were 4 times as likely to be obese as men ($P < .01$), yet food insecurity was not associated with obesity in this sample.

Conclusions and Implications: Ensuring the nutritional adequacy of donated food is an important consideration for food donors and pantry staff.

Key Words: food security, BMI, diet quality, food pantry (*J Nutr Educ Behav.* 2012; ■:1-6.)

INTRODUCTION

Access to food is a basic human need and fundamental right. Yet food insecurity—limited or uncertain access to nutritionally adequate, safe, and acceptable food¹—is present in millions of households across the United States (US). Recent estimates show 14.5% of US households are food insecure.² Hunger and food insecurity challenge the well-being of children, adults, families, and communities. The negative outcomes of food insecurity across the life course, including physical impairments, obesity among women, psychological suffering, and sociofamilial disturbances,³⁻⁶ represent a serious, yet avoidable, public health issue.

An important response to the problem of hunger and food insecurity in the US has been both public and private food assistance programs. The

majority of nutrition assistance to the low-income population is provided by the public sector, through the Supplemental Nutrition Assistance Program (SNAP, formally known as food stamps); School Lunch and Breakfast Programs; and the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC). The private sector plays a valuable, complementary role to federal assistance programs. Private organizations—food banks, food pantries, soup kitchens, and shelters—have helped to prevent even greater rates of hunger in America's low-income population.⁷

Over the past 3 decades, the demand for charitable food assistance, and the number of charitable food programs, has dramatically grown. Private food assistance is delivered through a national network of approximately 33,500 food pantries, 4,500 soup kitchens, and 3,600 emer-

gency shelters. An estimated 33.9 million Americans receive food from food pantries.⁷ There are an estimated 50 food pantries within the city of Hartford, CT.⁸

People who go to food pantries are a subgroup of concern, as they have limited resources to purchase food and therefore rely on the availability and quality of donated food. The goal of this study was to examine relationships between food security status, diet quality, and body mass index (BMI) of food pantry clients in Hartford, CT. The results contribute to the understanding of the health and nutritional needs of food pantry users in Hartford, CT and reports on baseline data collected as part of a longitudinal evaluation of a community-based program called *Freshplace*, a new food pantry designed to build long-term food security and self sufficiency of clients. This study reports on baseline data before participants were randomized into the *Freshplace* program.

STUDY DESCRIPTION

Setting and Participants

Although Connecticut is the second wealthiest state in the US, Hartford is the second poorest medium-sized city in the country, with a poverty

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rate of 31.9% in 2009.⁹ The poverty rate for the North End neighborhood in this study is higher, at 32.5%.¹⁰ Less than 60% of Hartford's North End residents possess a high school diploma, and only 5% are college graduates. Approximately 85% of the North End is black with a very strong Caribbean presence, 14% is Hispanic, and less than 1% is Asian and Caucasian.¹⁰

Study participants were recruited from 2 food pantries in the North End of Hartford. Since this study was part of a longitudinal evaluation of *Freshplace*, study participants were drawn from the 2 pantries located closest to *Freshplace*. Based on data from Foodshare, the regional foodbank that serves greater Hartford, CT, both pantries were considered large based on average number of meals served per month (36,647 and 16,506 compared to an average of 5,845 meals for all pantries; self-reported data from the food pantries). Both pantries were "traditional" pantries housed within churches, run by volunteers, that hand out predetermined amounts of food. Each pantry had a different operating schedule. One pantry was open from 8-10 am on Tuesdays and Fridays, and the other from 4:30-6:30 pm on Thursdays. Researchers visited on different days of the week and at different times to ensure a more representative sample. Eligibility criteria for participants were that they be over age 18, living in 1 of 3 North End zip codes (06105, 06112, and 06120), and were receiving food from a food pantry.

Potential participants were recruited while waiting in line to receive food at the pantries. Participants signed informed consent and answered questionnaires in a private area in the pantries. In total, 219 participants were recruited into the study and completed baseline measurements. Seven were ineligible because of their zip code. Data were collected from June, 2010 to May, 2011. The University of Connecticut Health Center Institutional Review Board approved the protocol for this study.

Survey Instrument

All data were collected through in-person, interviewer-administered surveys. The survey instrument mea-

sured food assistance use, demographic information, food security, BMI, diet quality, and self-reported health. The survey took approximately 25 minutes to administer. An interviewer training session was conducted prior to data collection to ensure consistency between interviewers. Participants were asked how frequently they go to food pantries, and whether they receive SNAP, WIC, and go to soup kitchens. Participants were asked whether they or someone else in their household had been told by a doctor that they had diabetes or high blood pressure.

Food Security Status

Household food security was measured using the validated 18-item US Department of Agriculture Household Food Security Module.¹¹ Four categories of food security status were determined: (1) high, (2) marginal, (3) low, and (4) very low. For analyses, food security status was dichotomized (food secure, levels 1 and 2; food insecure, levels 3 and 4) based on US Department of Agriculture standards.

Body Mass Index

Height and weight were measured using a stadiometer (Seca 213, Seca, Hanover, MD, 2008) and digital medical scale (320KL, Healthometer, Alsip, IL), respectively. The measurements were used to determine BMI as follows: $(\text{weight [lb]}/\text{height [in]}^2) \times 703$. Body mass index was classified according to the following Centers for Disease Control criteria: BMI < 18.5 kg/m², underweight; 18.5 to 24.9 kg/m², normal weight; 25 to 29.9 kg/m², overweight; 30 to 40 kg/m², obese; and scores above 40 kg/m² indicate morbidly obese.

Diet Quality

To measure diet quality, the Block Food Frequency Screener was used. This screener has been shown to correlate well with the 100-item Block Food Frequency Questionnaire with respect to dietary intake.¹² Participants were asked 10 questions about their usual intake of fruit, vegetables, and fiber. Possible scores ranged from 0-50. Portion sizes were not included as part of the screener.

Data Analysis

Analyses were conducted using SPSS (version 18.0, SPSS, Inc, Chicago, IL, 2009). Descriptive statistics were reported to describe the overall sample. Chi-square tests and Spearman correlations were used to assess bivariate associations. The fruit/vegetable/fiber items on the Block Screener had good reliability (Cronbach $\alpha = 0.72$). Separate logistic regression models were estimated to predict food security status, dietary quality (scores above 17 points), and obesity. In each model, sex, age (over age 60), high school education, and monthly income (\$0; \$1-500; \$501-\$1,000; and over \$1,000) were included as independent variables.¹³ Food security was included as an independent variable in the models predicting diet quality and obesity.

RESULTS

In total, 212 surveys were completed. Sample characteristics are shown in Table 1. Pantry users were predominantly black (73.9%), followed by West Indian (19.0%), and female (59.0%). Median annual household income was \$8,088, and 74.4% had monthly incomes less than \$1,000. The mean age was 51.9 years, ranging from 19 to 87. Forty-four percent (44.3%) did not have their high school diploma or general education development, and only 20.3% were employed at the time of the survey.

Participants visited food pantries on a chronic basis, with 62.5% going at least once per week. Over half (57%) received SNAP, and almost half (44%) ate meals at a soup kitchen. Approximately 16.0% of the sample was food secure, 33.5% had low food security, and the remaining 50.5% had very low food security, meaning they were experiencing food insecurity with hunger. Of the 16.0% of households considered food secure, over half (8.5%) responded positively to 1 or 2 of the 18 indicators of food insecurity, indicating some concerns or difficulties in obtaining enough food.

Pantry users consumed limited amounts of fruit, vegetables, and fiber. Out of a possible 50 points on the Block Screener, the average score was 17.1 (SD 7.7). The mean BMI was

Table 1. Sociodemographic Characteristics of Hartford, CT Food Pantry Clients (n = 212)

Characteristics	n	%
Food security status		
High	16	7.5
Marginal	18	8.5
Low	71	33.3
Very low	107	50.5
Ethnicity		
Black	156	73.9
West Indian	40	19.0
Other/mixed race	15	7.1
Age (y)		
18-39	23	10.8
40-59	141	66.5
≥ 60	48	22.6
Education		
< High school diploma	94	44.3
High school/GED or higher	118	55.7
Employment		
Not employed	147	69.3
Employed	43	20.3
Retired	22	10.4
Monthly income (\$)		
No income	41	20.2
1-500	44	21.7
501-1,000	66	32.5
>1,000	52	25.6
Fruit, vegetable, and fiber scores		
0-16	103	48.6
17-36	109	51.4
Adult weight status		
Underweight (BMI < 18.5 kg/m ²)	6	2.9
Normal weight (BMI 18.5-24.9 kg/m ²)	52	25.4
Overweight (BMI 24-29.9 kg/m ²)	65	31.7
Obese (BMI 30-39.9 kg/m ²)	61	29.8
Morbidly obese (BMI > 40 kg/m ²)	21	10.2
Chronic disease		
Diabetes	56	26.4
High blood pressure	143	67.5
Food assistance		
Food stamps/SNAP	121	57.1
Soup kitchens	94	44.3
Food pantry visit frequency		
Less than once/wk	80	37.4
Once/wk	75	35.5
More than once/wk	57	27.0

BMI indicates body mass index; GED, general education development.

29.5 kg/m² (SD 7.0). Nearly 32% of the sample were overweight, 29.8% were obese, and 10.2% morbidly obese. Approximately one quarter (26.4%) of the sample reported that they or someone in their household had been told by a doctor that they had diabetes, and 67.5% had high blood pressure.

Bivariate associations are listed in Table 2. Age was significantly associated with food security status ($P \leq .01$), and older clients had higher rates of food security. Among those who were food insecure, only 18.5% were over age 60. Food security was negatively associated with going to soup kitchens ($P = .01$), but it was not asso-

ciated with SNAP participation or the frequency or number of visits to food pantries. In this sample, West Indians and seniors (over 60 years) were less likely to receive SNAP ($P < .01$, results not shown). Food security was positively associated with fruit, vegetable, and fiber scores ($P = .02$). Food insecurity was not significantly associated with obesity. There is a strong association between gender and BMI (χ^2 test; $P \leq .01$); among those who were obese/morbidly obese, 78.0% were women (results not shown).

In a logistic regression model predicting food security, age was a significant predictor of food security (odds ratio [OR] = 3.1, confidence interval [CI] 1.4, 7.0, $P < .01$), when controlling for sex, education, and income. Participants over age 60 were 3 times as likely to be food secure as younger pantry clients. When predicting obesity, women were over 4 times more likely than men to be obese (OR = 4.2, CI 2.2, 8.0, $P < .01$), controlling for the same variables as the earlier model. Food security was not a significant predictor of obesity. In the model predicting diet quality, those who were food secure were over twice as likely to eat fruit, vegetables, and fiber (OR = 2.3, CI 1.1, 5.2, $P = .05$) as those who were food insecure. Results are shown in Table 3.

DISCUSSION

Literature on food pantry clients is not extensive, and much is dated (over 5 years old),¹³⁻¹⁶ from Canada,¹⁷ and qualitative.^{15,16} This research provides current descriptive information about the food pantry clientele of the North End of Hartford. This study examined possible consequences of food insecurity as they relate to diet quality, obesity, and chronic disease, and it draws attention to the need for further research on health outcomes and food insecurity.

Although study participants were receiving charitable food assistance on a chronic basis, more than half (50.5%) were still categorized as having very low food security, meaning they were experiencing hunger, such as skipping meals. In this sample, 62.5% of households went to a food pantry at least once per week, and 44.0% went to a soup kitchen regularly to eat a meal, indicating a high

Table 2. Household Characteristics of Hartford, CT Food Pantry Clients by Food Security Status

Characteristic	n	Food Secure	Food Insecure ^a	P ^b
Age (y)				
18-59	164	55.9	81.5	.01*
≥ 60	48	44.1	18.5	
Education				
Less than high school	94	52.9	42.7	.27
High school/GED	118	47.1	57.3	
Sex				
Female	125	64.7	57.9	.46
Male	87	35.3	42.1	
Fruit, vegetable, fiber scores				
Low scores (0-16)	103	29.4	52.2	.02*
High scores (17+)	109	70.6	47.8	
Weight status				
Underweight/normal	58	33.3	27.3	.48
Overweight/obese	147	66.7	72.7	
Food assistance use				
SNAP	121	50.0	58.4	.36
No SNAP	91	50.0	41.6	
Soup kitchens	94	23.5	48.3	.01*
No soup kitchens	118	76.5	51.5	
Food pantries at least once per wk	132	52.9	64.4	.21
Pantries less than once per wk	79	47.1	35.6	

GED indicates general education development; SNAP, Supplemental Nutrition Assistance Program.

* $P < .05$ is statistically significant; ^aFor these analyses, food security status was dichotomized into 2 categories, food secure (high food security and marginal food security) and food insecure (low food security and very low food security);

^bChi-square tests were used to assess bivariate associations.

Table 3. Logistic Regression Models Predicting Food Security, Obesity, and Diet Quality of Hartford, CT Food Pantry Clients (n= 212)

Predictor, independent factors	OR	95% CI	P
Food security			
Female	1.3	0.6, 2.9	.49
Over age 60	3.1	1.4, 7.0	< .01*
High school degree	0.8	0.4, 1.8	.63
Monthly income	1.1	0.8, 1.6	.66
Obesity			
Female	4.2	2.2, 8.0	< .01*
Over age 60	1.3	0.6, 2.7	.53
High school degree	0.8	0.4, 1.6	.57
Monthly income	1.0	0.8, 1.3	.96
Food secure	1.1	0.5, 2.5	.86
Fruit, vegetable, fiber consumption			
Female	0.9	0.5, 1.5	.58
Over age 60	1.7	0.8, 3.6	.13
High school degree	0.9	0.5, 1.6	.63
Monthly income	1.2	0.9, 1.5	.26
Food secure	2.3	1.1, 5.2	.05*

CI indicates confidence interval; OR, odds ratio.

* $P < .05$ is statistically significant

level of unmet need among food pantry recipients. It raises an additional concern about the dependence on charitable food assistance programs as a response to hunger. Although charitable food assistance may have alleviated some of the food deprivation in the households studied, it clearly did not prevent the majority of them from being food insecure.

As food insecurity increased, consumption of all fruits and vegetables decreased. Results are consistent with previous research documenting poor diet quality among female pantry users and poor nutritional quality of food provided by food pantries.¹⁸⁻²⁰ It is well recognized that nutritious and costly food items are often eliminated from the diet with limited funds for food purchase.^{4,21} The association between food insecurity and low fruit and vegetable consumption may also be related to lack of access to these food items in the surrounding neighborhood,^{13,22} as low-income neighborhoods often lack grocery stores that carry affordable, healthy products and produce.²³

The pantry population was overwhelmingly overweight or obese (72.0%). The mean BMI was 29.5, which exceeds the upper limit of the recommended healthy range. The lack of association between food insecurity and obesity is likely caused by the limited variability of both outcomes in this sample, and therefore one should use caution when interpreting results. However, women were significantly more likely to be obese than men, which is consistent with findings in previous literature.^{3,6}

As other research on emergency food providers has shown,¹⁴ a large number of food pantry recipients (42.9%) were not enrolled in SNAP. Households lacking citizenship often avoid SNAP and other welfare programs, fearing that enrollment could adversely affect their immigration status in the US.²⁴ In this sample, West Indians and seniors (over 60 years) were less likely to receive SNAP ($P < .01$). Food pantries are therefore an important venue for targeted outreach on SNAP eligibility.

Limitations

With the exception of BMI, all data were self-reported, introducing

a variety of social response biases. Although food insecurity and diet quality were measured using validated tools, the survey itself was not tested for reliability and validity. In addition, measurement of chronic disease was defined by “you or someone in your household.” The Block Screener does not measure actual serving sizes, which may bias results. There was a lack of variability of race and ethnicity, weight status, and food security status, as the population was predominately black, overweight or obese, and food insecure. Therefore, sample sizes within these categories may have been too small to detect significant differences. The findings of this study are specific to pantry clients who live in the North End of Hartford and may not be generalizable to other pantry populations.

IMPLICATIONS FOR RESEARCH AND PRACTICE

Despite the growth of charitable food assistance over the past 3 decades, food insecurity rates remain high, and food insecurity is linked to poor diet quality. More effective responses to hunger, such as those addressing severe and chronic poverty as the root causes of food insecurity, are urgently needed. Because of the high rates of chronic diseases and poor diet quality among pantry clients, and the fact that urban, minority communities often have limited availability of healthy food, ensuring the nutritional adequacy of donated food is an important consideration for donors and food pantry staff.

A large proportion of the food pantry population, particularly women, is obese, which suggests that the food insecure eat too much of the wrong type of calories, rather than getting insufficient calories, as is consistent with previous research.²¹ Well-meaning donors may inadvertently be contributing to health disparities as they attempt to “fight hunger.” Results highlight the need to improve the nutritional quality of the food provided by pantries. Positive steps in this direction include mobile food pantries that provide fresh fruits and vegetables from a truck with refrigeration to high-need areas.²⁵

This study reveals a picture of food scarcity, poor dietary quality, and high prevalence of chronic diseases among food pantry users. Within this sample, younger clients are more likely to be food insecure than seniors, suggesting that separate safety nets, like Social Security, are available to seniors and may improve food security.

Strengthening the antihunger safety net and improving access to nutritious food are critical steps toward eradicating food insecurity and obesity. The numbers of charitable food programs has risen sharply, but those receiving food aid on a chronic basis have high rates of food insecurity, obesity, and poor diet quality. New approaches are needed to address the underlying issues of poverty that create food insecurity, and to create higher nutritional standards for charitable food.

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