

Impact of participating in the Expanded Food and Nutrition Education  
Program on Food Insecurity

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## **Introduction**

Having enough food to eat is a problem that effects approximately 10.9 percent (about 550,000) of Tennesseans (Nord et al., 1999). This rate is higher than the national prevalence of 9.7 percent. In the past, the term hunger was used to describe this phenomenon but measurement was difficult because of the lack of a commonly accepted definition and the lack of instruments to measure the problem. In 1990, a panel of experts from the American Institute of Nutrition developed the conceptual definitions for hunger, food security, and food insecurity (Anderson, 1990).

***Food security:*** *access by all people at all times to enough food for an active, healthy life. Food security includes at a minimum: (1) the ready availability of*

*nutritionally adequate and safe foods, and (2) an assured ability to acquire acceptable foods in socially acceptable ways*

***Food Insecurity:*** *limited or uncertain availability of nutritionally adequate and safe foods or limited or uncertain ability to acquire acceptable foods in socially acceptable ways.*

***Hunger:*** *The uneasy or painful sensation caused by a lack of food.*

An 18-item household questionnaire was developed which enables researchers to study food insecurity and hunger. The development and validation of this tool has been described elsewhere (Carlson et al., 1999; Basiotis P.P. (1992); Radimer, et al. 1990; Briefel and Woteki 1992).

The Expanded Food and Nutrition Education Program (EFNEP) is a USDA-funded community-based nutrition education program administered through the individual state and territory Extension Services. The primary audience of EFNEP is low-income families who have children under 18 years of age living in the home. This program teaches adults and youth basic nutrition focused on helping families apply the Food Guide Pyramid and the Dietary Guidelines. Families in this program also learn how to manage food resources including food shopping and they learn how to prepare healthful meals using low-cost ingredients. Because EFNEP families are low income they are at risk for food insecurity and the health consequences associated with food insecurity.

EFNEP employs and trains paraprofessional program assistants (PAs) with similar cultural and ethnic backgrounds to the target clientele to deliver the educational

program. These program assistants recruit participants and teach nutrition education lessons in small groups or in one-on-one sessions in the client's home.

According to Healthy People 2010 (U.S. DHHS), low-income individuals are at greater risk for chronic disease such as heart disease, stroke, cancer and diabetes. Epidemiologists have used various methods to measure the health status of individuals including self-reported health status. The Global Health Assessment Scale (GHAS) is five-point scale that asks respondents to rate their health status as excellent, very good, good, fair, or poor. The GHAS scale or some variant of it has been used extensively in epidemiological studies because it provides a succinct way of summarizing the diverse components under the broader health status domain (Krause and Jay, 1994). Self-reported health using this measure captures such health problems as limitations in physical functioning, chronic or acute conditions and to a lesser extent, mental health problems and correlates with the risk of mortality and morbidity. (Idler and Angel, 1990; Kaplan and Camacho, 1983; Krause and Jay, 1994). Including the GHAS measure in the food security questionnaire is an efficient way to study whether a relationship exists between food insecurity and health status.

The goal of this research was to examine the relationship between food insecurity and participation in nutrition education classes and the relationship between food insecurity and overall health status. In order to meet this goal, four research questions were determined:

1. What is the impact of participation in the EFNEP program on food security status?
2. What demographic factors impact the food security status of EFNEP participants?

3. Is there a difference in the food support programs participation of food secure and food insecure individuals?
4. Do food insecure individuals have poorer health status than food secure individuals?

### **Methods**

Subjects in this study were an intervention group composed of individuals enrolled in the EFNEP program and a comparison or non-intervention group of subjects who were not enrolled but eligible for the EFNEP program, or enrolled but had completed no more than one lesson. Members of the intervention group had completed two or more lessons with most individuals being within one or two lessons of graduating from the EFNEP program. Participants graduate from the EFNEP program after completing an average of 12 lessons, depending on their individual needs. A convenience sample was obtained by interviewing participants who were scheduled for an EFNEP lesson or were being recruited for the program during a specific time frame from August 5 to August 24, 2001.

The EFNEP program assistants were already trained in interview techniques with this clientele as a part of their regular duties. During the EFNEP enrollment process and during the exit interview, program assistants interview EFNEP participants to complete a food behavior checklist and a 24-hour dietary recall. This experience gives the program assistants experience in conducting interviews with this clientele. This experience made the EFNEP program assistants good choices for conducting interviews with the subjects in this study. The program assistants were given additional training in interview and data collection techniques relative to the survey instrument used in this study.

The food security classification of each participant was measured using the 18-item household food security questionnaire (Bickel et al. 2000). This instrument has been shown to be a valid and reliable measure of food insecurity (Frongillo, 1999). The results of this instrument provided score representing the food security status of the individual. Using responses from the questionnaire, a food security scale score, ranging from 0.0 to 9.3 can be calculated. The food security scale score is then used to determine the individual's food security status category. Food security status indicates whether the household is food secure, food insecure without hunger, food insecure with moderate hunger, or food insecure with severe hunger. The method for calculating the food security scale and food security status classification is described by Bickel et al. (2000).

Health status of the individual was determined by the response to a question in the survey that asks the respondent *"Is your health in general: excellent, very good, good, fair or poor."* This measure of health status has been tested for validity and reliability and has been determined to be an appropriate measure of health status (Idler and Angel, 1990; Idler and Kasl, 1991; Krause and Jay, 1994; Kaplan and Camacho, 1983).

County type was calculated using Tennessee census classification of rural and urban counties (Tennessee Statistical Handbook, 2000).

Demographic variables collected in the interviews included race, age, educational level, participation in food programs, number of children, marital status, county type, gender and income.

### **Data Collection**

A total of 25 program assistants in 18 counties assisted in data collection. Three hundred and thirty-two subjects in the intervention group and 245 in the comparison

group completed interviews. The intervention group consisted of those subjects who had received two or more lessons. Those who had completed no lessons or only one lesson were classified as non-intervention, or the comparison group.

### **Data Analysis**

Data were analyzed using SAS statistical software v.8.2 (SAS Institute, 2000). Food security status was calculated following guidelines by Bickel, et al. (2000). Descriptive statistics were calculated including frequencies, measures of central tendency and measures of distribution for each variable in the study.

To examine whether non-intervention group was demographically similar to the intervention group, t-tests were used to compare the two groups based on race, age, educational level, food program participation, health status, number of children, marital status, gender, and income.

To determine which variables were associated with food security status, a logistic regression equation was constructed with food security as the dependent variable. The independent variables entered into the equation were county type, race, age, educational level, participation in food programs, health status, number of children, marital status, gender and income. A forward logistic regression analysis was conducted to examine the point at which the independent variables enter the equation. Using logistic regression analysis, odds ratios were determined for variables that were included in the model. The odds ratio is analogous to  $R^2$  in that it measures the strength of the association between the food security scale and the independent variables.

## **RESULTS**

The majority of the subjects in the study were female and more than half lived in an urban community. The subjects were equally distributed by race.

The intervention and comparison groups were not significantly different from each other based on the demographic variables of race, gender, marital status, education, rural versus urban county, number of food programs in which they participate, and number of children in family. However, the intervention group was significantly older by an average of two years. The two groups differed significantly based on the food security score. The intervention group had a lower food security status score than the comparison group. This indicated that the respondents who had participated in more lessons in the EFNEP educational program were more food secure than the respondents who had not yet started or who had just started participation in the EFNEP program.

A higher proportion of the subjects reporting good or better health were food secure while a higher proportion of the subjects reporting fair or poor health were food insecure. The majority of the subjects who reported excellent, very good or good health was food secure. But most of the subjects who reported fair or poor health were food insecure.

The variables that were significantly associated with food insecurity were health, income, nutrition education intervention, food program participation, and marital status.

The subjects who had not participated in the EFNEP program were more likely to be food insecure than subjects completing two or more lessons in the EFNEP program, were more likely to use food support programs and were half as likely to have excellent

health status. When compared to married with spouse in the household, the divorced and separated households were about more likely to be food insecure.

## **Conclusions**

Based on findings in this study, participation in a series of nutrition education programs that teach basic nutrition, food resource management and basic cooking skills is related to a reduction in food insecurity. This study also found that subjects who are food insecure have poorer health status than food secure subjects. Subjects who had completed one or fewer lessons in the EFNEP program were almost two times more likely to be food insecure compared to subjects who had completed two or more lessons. This evidence supports the achievement of the EFNEP behavioral objective of the participant's running out of food less often. In the Tennessee EFNEP report for November 11, 2000, 40 percent of program participants at entry compared to 23 percent of participants at graduation from the EFNEP program, said they sometimes or often ran out of food before the end of the month. The EFNEP families at graduation also had increased intakes of protein, iron, calcium, vitamin A, vitamin C and vitamin B6 and a reduction in total caloric intake.

Health was the first variable that loaded into a forward stepwise logistic regression model and food insecure individuals with severe hunger were half as likely to report excellent health as food secure individuals. The exact nature of the association between food security and health status needs further study, but it is well established that poor diets contribute to poor health and that low-income individuals are at greater risk for poor health than higher income people.

The finding in this study support the need for multi-session nutrition education for low-income households, focusing on teaching basic nutrition, food shopping, and cooking skills. The impacts of such programs can be increased food security for participants, better health, and more efficient use of food resources.

This study needs to be replicated in other nutrition education programs to determine if similar results are found or if there are other variables that contribute to the success of the program in decreasing food insecurity.

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