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Food Assistance Programs and Healthy Diet among Low-Income Individuals

by

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Introduction

One of the major goals of food and nutrition assistance programs is to improve the nation's nutrition and health. In fiscal year 2006, nearly 27 million people participated in the FSP every month, or about one in 11 Americans participated in the Food Stamp Program (FSP) (Oliveira 2007) and the WIC served almost half of all infants born in the U.S. and about one-quarter of all children ages between one and four (ERS/USDA 2007). The FSP has increased household food expenditures; however, there is little evidence that the program has a positive influence on food intake patterns (Fox et al. 2004). Wilde et al. (2000b) found that food stamp participation tends to increase one's intake of meats, added sugars, and total fats; but does not significantly change one's intake of fruits, vegetables, grains, and dairy products. Past research showed that the participation in Women, Infant, and Children program (WIC) increases the consumption of certain types of WIC approved foods, i.e., fruit and vegetables juices, low-sugar cereals; and decreases the consumption of non-WIC beverages such as soft drinks (Oliveira and Chandran 2005). In a recent study, Duffy et al. (2008) found that both the FSP and the WIC were not associated with the consumption of a healthy diet as measured by the 1995 healthy eating index (HEI) developed by the USDA. The finding of the lack of association of the WIC and healthy diet was unexpected due to the program's restrictions on the food that participants can purchase.

The purpose of this study is to reexamine the factors that influence consumers' decisions to eat a healthy diet, in particular, the impact of the FSP participation on the demand for a healthy diet. In this study, the NHANES 2001-02 and the 1995 HEI was used to examine the demand for a healthy diet. The current study is different from the Duffy et al. study in two ways: (1) we focused on low-income individuals only; (2) we assumed that FSP participation and healthy diet are simultaneously determined.

Theoretical Model and Data

Household production theory assumes that the household's decision-making is concerned with the efficient use of market goods (***q***), time (***l***), and human and physical capital (***k***) as inputs in the production of utility yielding, non-market goods (***z***). At the first stage the household may be characterized by cost-minimizing behavior and in the second stage, the household chooses **z** to maximize utility, *u*. The solution of this two-stage stage problem is the demand equation for ***z***

(1) $$\boldsymbol{z} = z(\boldsymbol{p}, \boldsymbol{w}, m; k).$$

Where ***w*** is a vector of wage rates for different types of labor inputs and m is the household income. In this study, we assume that a healthy diet is one of the non-market goods (***z***) that consumers are interested. In addition, we assume that the participation of the FSP is a significant factor on the demand for a healthy diet. The relationship can be written as

(2) $$HEI = \gamma\, FSP + \beta_1\, x_1 + \varepsilon_1,$$

$$FSP = \beta_1 x_2 + \varepsilon_2;$$

where HEI is 1995 healthy eating index; FSP = 1 if the respondent participated in the FSP, otherwise, FSP =0; x_1 and x_2 are vectors of explanatory variables; βs and γ are parameters to be estimated; and ε_1 and ε_2 are disturbance terms. Equations in (2) were estimated using the procedure proposed by Amemiya (1979) (Maddala, 1983, pp. 244-5). Only the records of those participants who were older than 20 years; had a poverty index ratio equal or less than 1.6; and were not pregnant were used. Note that the HEI scores for NHANES 2001-02 in the subsample ranged from 21.9 to 99.1; therefore, HEI in (2) was treated as an observed variable.

As shown in equation (1), the explanatory variables of the demand for a healthy diet *(z)* include the prices of market goods (*p*), wage rates (*w*), income (*m*), and capital endowment in the household (*k*). Input prices were not recorded in the survey; however, since the data covered only a one-year period, we assumed that all participants faced similar input prices, thus, input prices were not included as explanatory variables. Wage rates for the participants were not recorded; therefore, the household incomes were used as proxies for wage rates. In addition, we assumed that the wage rates for the labor that was used to prepare food were related to the household income of the participant.

We assumed that participants' diet quality varies partially with their knowledge about how to prepare food (Carpenter et al. 2002) and this food preparation knowledge is partially related to participants' age, race, ethnicity, diet habits, and lifestyle. Socio-economic and demographic variables include household income, race, Hispanic origin, age, gender, education, and marital status. The dietary variables include if the participant ate breakfast during the one-day recalls, the number of different dietary supplements the participant took, if the participant participated in the FSP and/or WIC, and the adult food security status. Four variables are closely related to participants' lifestyle – smoking, use of alcohol, hours spent watching TV, and exercise.

Results

The coefficient for the FSP variable was not statistically different from zero, while the coefficient for WIC is positive and statistically different from zero. The positive impact of WIC on healthy diet found here may indicate the differences in food purchase requirements between the FSP and the WIC. Participants in the WIC are required to purchase certain types and/or brands of food, while participants of the FSP face no such restrictions. The coefficient for the food security variable is negative indicating that when a participant did not have enough to eat, s/he was unable to have a healthy diet.

Results show that demographic, dietary, and lifestyle factors are related to the HEI. Females had higher HEI scores than males; female participants of ages over 50 had higher HEI scores than those females of ages younger than 50; and older participants had higher HEI scores. Household income and marital status had no impact on HEI scores. Race and ethnicity seem to play important roles in the demand for healthy diet. Specifically, results show that Blacks had lower HEI scores than White; and other races had higher HEI scores than White. Hispanics had higher HEI scores than non-Hispanics. Participants who ate breakfast and those who took more

dietary supplements had higher HEI scores than their counterparts. The hours of watching television or using computer had a negative impact on HEI; the intensity of exercise had a positive impact on HEI; and pervious smokers and current smokers had lower HEI scores than non-smokers.

Conclusion

Results found in this study indicate that the FSP participation had no discernible impact on the dietary quality of low-income individuals; however, participation in the WIC improved the healthiness of their diet. One of the major differences between the FSP and the WIC programs is that the WIC participants are restricted to purchasing certain types of foods and attend classes to learn about nutrition, while the FSP participants are not subject to these requirements. The restriction imposed on the kinds of food items and brands that WIC participants can purchase may improve the healthiness of their diets.

Table 1. HEI and FSP participation

	Coefficient	Standard Error	t-statistic	p-value
FSP (Instrumental Variable)	-0.0293	0.0666	-0.4410	0.6595
Constant	58.4271	1.7460	33.4630	0.0000
Demographics				
Female	0.7786	0.9862	0.7890	0.4298
50 yrs and > 34 yrs	-0.4928	0.9274	-0.5310	0.5952
≥ 64 and > 50 yrs	2.4829	1.1149	2.2270	0.0259
> 64 yrs	2.7658	1.1196	2.4700	0.0135
Income	0.0008	0.0188	0.0430	0.9656
Married	0.7084	0.8642	0.8200	0.4124
Divorced	-0.7558	1.0076	-0.7500	0.4532
College Education	2.3799	0.7597	3.1330	0.0017
Black	-2.6785	0.8563	-3.1280	0.0018
Other Race	2.5094	1.8858	1.3310	0.1833
Hispanic	3.5761	0.8274	4.3220	0.0000
Dietary and Meal Pattern				
Ate Breakfast	3.7654	0.7802	4.8260	0.0000
# Food Supplements	0.7428	0.2136	3.4780	0.0005
WIC	2.5365	0.9280	2.7330	0.0063
Food Security	-0.6404	0.3157	-2.0290	0.0425
Self-Evaluation				
Overweight/obese	-0.6991	1.0451	-0.6690	0.5036
Under-Assessor	2.1139	1.3424	1.5750	0.1153
Over-Assessor	-0.2576	1.6942	-0.1520	0.8792
Excellent Health	0.0683	0.8483	0.0810	0.9358
Goof Health	-0.0964	0.7404	-0.1300	0.8964
Lifestyle				
Hours TV	-0.0345	0.2095	-0.1650	0.8693
Exercise (METs)	0.0575	0.0395	1.4550	0.1458
Former Smoker	-3.0519	0.8532	-3.5770	0.0003
Current Smoker	-3.8426	0.8083	-4.7540	0.0000
#Drinks/Day	0.0557	0.1184	0.4700	0.6380