

Effect of Government Food Programs on Nutritional Value of Food Purchases

Honors Program - Project of Excellence

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Abstract

Childhood obesity is of high national concern and disproportionately affects low-income children. Many of these children receive government assistance to purchase food, yet it remains unclear whether this assistance helps or harms the nutritional status. The purpose of this study is to explore the relationship between participation in government food programs and the nutritional value of routine food purchases. An exploratory descriptive survey study was conducted in a sample of low-income families in South Texas. A food score was calculated for each participant based on the degree of nutritional value of foods selected as routinely purchased items. No significant relationship was found between use of government food programs and nutritional value of foods commonly purchased. A higher level of education was related to selecting foods higher in nutritional value indicating that more emphasis should be placed on the completion of secondary education and nutritional counseling in this population.

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Forty-five percent of children in the United States (US) live at or below poverty level (Addy, Engelhart, & Skinner, 2013) and about 17% of them receive some type of government assistance to purchase food (USDA/Food and Nutrition Service, 2015a; USDA/Food and Nutrition Service, 2015b; US Census Bureau, 2015). Children from low-income households are twice as likely to be obese as those from higher income households (Singh et al., 2010), which adds to health disparities because obesity in children is related to many adverse physical and psychological conditions including, cardiovascular disease, glucose intolerance, respiratory problems, low self-esteem, and poor emotional functioning (CDC, 2015).

Unlike adult overweight/obesity which is related to the receipt of government food subsidies (Gibson, 2006; Meyerhoefer & Pylypchuk, 2008; Webb, Schiff, Currivan, & Villamor, 2008), childhood overweight/obesity has not been found to be consistently related to government food assistance (Gundersen, 2015; Kohn, Bell, Grow, & Chan, 2014; Nguyen, Shuval, Bertmann, & Yaroch, 2015; Ver Ploeg & Ralston, 2008). Thus although poverty contributes to childhood obesity, it has yet to be determined whether the US government's efforts to assist the poor in purchasing food are providing optimal benefit to the large number of low-income, overweight/obese children in the US.

This article seeks to explore the effects of government food subsidies on the "healthiness" or level of nutritional value of foods purchased by families receiving government assistance in the form of the Supplemental Nutrition Assistance Program (SNAP) and the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC). The overall goal of this work is to inform current and new interventions aimed at increasing the nutritional value of foods purchased by low-income recipients of government food programs in an effort to decrease

childhood obesity and its multiple adverse effects on children and their families. The research question asked was: *Does participation in government food programs such as SNAP or WIC influence the nutritional value of foods routinely purchased by low-income families?*

Background

Childhood Overweight/ Obesity and Income

In children, *overweight* is defined by the Center of Disease and Control (CDC) as having a body mass index (BMI) between the 85th and 95th percentile, and *obesity* is defined as having a BMI greater than or equal to the 95th percentile (CDC, 2015). Childhood obesity in the US tripled from 1971 to 2002 but plateaued from 2003 to 2012 (Anderson & Butcher, 2006; Ogden, Carroll, Kit, & Flegal, 2014); however, this plateau was not consistent across income levels. There was a continued increased trend in the BMI of low-income children and adolescents between 1971 and 2008 (Murasko, 2011) and despite a stabilization of obesity rates from 2008 to 2011 (Pan, McGuire, Blanck, May-Murriel, & Grummer-Strawn, 2015), obesity continues to be high and disproportionately associated with low-income families (CDC, 2015).

Government Food Programs History

Originating in the 1930's, the Food Stamp Program was the first government funded food supplement program (USDA/Food and Nutrition Service, 2014). It was initiated during the Great Depression due to high unemployment and a surplus of food brought about by a dramatic drop in prices paid to farmers for crops. A more formally organized "Food Stamps Plan" was started in 1939 under the administration of President Franklin D. Roosevelt within the New Deal program (USDA/Food and Nutrition Service, 2014). Once World War II had ended, in 1943, the economy began to boom and the program was ended due to a large reduction in the number of people living in poverty (Snap to Health, 2016).

President Kennedy restarted the program in 1961, and in 1964, President Johnson signed the Food Stamp Act (USDA/Food and Nutrition Service, 2014) whose goals were to better manage agricultural overproduction and improve nutrition among people with low-incomes. In 1969, at the Food, Nutrition, and Health White House Conference, plans for a Special Supplemental Food Program for Women, Infants, and Children (WIC) were put in progress (Oliveira, Racine, Olmsted, & Ghelfi, 2002). In 1975, WIC became an official program that now provides supplemental nutrition, nutrition education, and doctor referrals for pregnant women, post-partum women, infants, and children under five years old (Johnson, Giannarelli, Huber, & Betson, 2015; USDA/Food and Nutrition Service, 2015). In 1981, the SNAP-Education (SNAP-Ed) program began to deliver nutrition education to SNAP recipients in a few states and by 2004, the program had gone nationwide (Snap to Health, 2016). The Supplemental Nutrition Assistance Program (SNAP) later replaced the Food Stamp program in 2008 (USDA/Food and Nutrition Service, 2014).

Since the inception of the original “Food Stamps Plan” in 1939, legislators were concerned that the stamps should not be used to purchase alcohol, tobacco, or foods eaten at stores. In the 1960’s, the House of Representatives attempted to limit the purchase of soft drinks and “luxury foods” with food stamps but this provision did not make it to the final version of the bill (Snap to Health, 2016). In 2014, President Obama signed the 2014 Farm Bill which aims at increasing the nutritional value of foods purchased with food stamps. It does not permit the purchase of alcohol, tobacco, hot food, or any food sold for on-premises consumption, i.e. fast food; however, it does allow the purchase of soft drinks, snack foods (such as cookies, candy, and crackers) and ice cream.

Review of the Literature

Several correlational studies aimed at describing the relationship between participation in government food programs and childhood obesity have been conducted in the US. Most have used large databases such as the National Health and Nutrition Examination Survey (NHANES) from various years (Kohn, Bell, Grow, & Chan, 2013; Leung et al., 2013; Ver Ploeg, Mancino, Lin, & Guthrie, 2008). NHANES is a national survey designed to assess the nutrition and health of both adults and children. It includes physical examinations and interviews (CDC/National Center for Health Statistics, 2015). Others (Baum, 2007) used data from the National Longitudinal Survey of Youth (1979 cohort) and Simmons et al., (2012) used data from the Oregon Head Start Program from 2008-2010.

Results from these studies have been conflicting with the majority, finding no relationship between receipt of government funds for food and children's BMI and obesity (Leung et al., 2013; Simmons et al., 2012; Ver Ploeg et al., 2008). Kohn and colleagues (2013) found a significant relationship, but only in children who were food-secure, i.e. children who had reliable access to affordable, nutritious food. Baum (2007) found a significant correlation between obesity and participation in government food programs, but only in female participants – and this study only included data from 1979. To our knowledge, few studies have been conducted to answer this question using more recent data not obtained from a large database.

In summary, childhood obesity is of high national concern as almost 1/3 (32%) of US children are overweight or obese (Ogden et al., 2014). Moreover, obesity disproportionately affects low-income children, yet it is unclear how government assistance to purchase food may affect childhood obesity. Since the 1930's legislators have worked to provide healthy food to poor children but to date, government assistance can still be used to purchase foods that are known to contribute to obesity. Despite national efforts to provide nutrition education to SNAP

participants, obesity rates in low-income children continue to increase or remain stable at a very high rate. This study explored whether participation in government food programs was associated with the purchase of higher nutritional value foods in a sample of families residing in South Texas.

Design

An exploratory descriptive survey study was undertaken to describe the relationship between receipt of government food programs (SNAP or WIC) and the degree of nutritional value in selected common food purchases in a sample of primarily low-income families residing in a medium-sized South Texas county.

Method

Setting and Sample

After approval by the Texas A&M University – Corpus Christi Institutional Review Board, a 1-page survey, Spanish on one side, English on the other, was distributed to a low-income population in South Texas at two locations: 1) a public health district office and 2) a popular arts and education center, both located in areas primarily inhabited by a low-income population. The public health district office provides health services, health information and vital records services, assistance with WIC services, and other community health-related services to community members. The arts and education center provides programs in dance, art, health, nutrition, and literacy and is a hub for community cultural events aimed toward families in the community.

To be included in the study, participants had to: be over 18 years old; have children under the age of 18 years living in their household; and be able to read and write in either English or Spanish. Only one person per family was asked to participate. The needed number of participants

was determined through a power analysis using a desired power of 80%, an alpha of 0.05, and a medium effect size of 0.2. The analysis yielded a desired minimum sample size of 150.

Survey Tool

The Food Survey tool was created by the researchers and consisted of several demographic questions including age, gender, marital status, educational level, annual family income, number in household, and whether or not SNAP/WIC assistance was received. Following the demographic information, participants were asked to select foods they purchased on a routine basis from a list of 96 food and drink items. The food and drink items listed were in accordance with the “Key Foods List” resulting from the What We Eat in America (WWEIA) component of the National Health and Nutrition Examination Survey (NHANES) 2011-2012 (Haytowitz, 2015). The 96 food and drink items were then grouped into three different categories: green, yellow, and red, based on the “traffic light” nutrient levels used to categorize foods according to nutritional quality in the United Kingdom (UK) (Lobstein & Davies, 2009). This type of “nutrient profiling” (Lobstein & Davies, 2009, p. 331) was developed to improve the consumption of healthy food in efforts to decrease obesity and cardiovascular disease and guide the development of restrictions on food advertisements targeting children.

The “traffic light” categorization method examines the fat, sugar, and salt content in 100g (or 100 ml) of individual food and drink items. Each item is then placed into 1 of 3 levels: green (low), amber (medium), or red (high) according to whether the levels of fat, sugar and salt are high, medium, or low (Lobstein & Davies, 2009). For this survey, the fat, sugar, and protein content of each food/drink item was used. The USDA National Nutrient Database for Standard Reference (USDA/Agricultural Research Service, 2015) was used to determine the amount of each nutrient per 100 g or 100ml. All fruits and most vegetables were automatically placed in the

green category. The grams of sugar and fat present in 100 g or 100 ml of each of the remaining items was added together and divided by grams of protein to give each item a single digital score. Cutoff points for each category were determined. *See Table 1.* The resulting food list consisted of 36 green (or healthier items (low in fat and added sugars and/or higher in protein); 14 yellow (or moderately health items) and 46 red (or least healthy) items.

Each survey received a food score. The score was generated from the following coding scheme: green category foods/drinks received 10 points, yellow received 5 points, and red received 0 points. The score was an average of the points scored for each food selected. The higher the score, the healthier the foods selected. Surveys were anonymous and were coded only according to participant location.

	GREEN Foods	YELLOW Foods	RED Foods
$\frac{\text{Fats + Sugar}}{\text{Protein}}$	>1.0 *	0.4-1.0 *	0.0-0.39 *
Survey Score	10 pts	5 pts	0 pts
Included Foods	Eggs, wheat bread, pretzels, fruit, vegetables, beans, oatmeal, lean meat, grilled chicken, salmon, tuna, & tofu	Milk, yogurt, nuts, pork, pasta, rice, fried chicken, cheese, peanut butter, refried beans, corn tortillas, & flour	High fat dairy, pre-made food, honey, soda, ramen noodles, alcohol, sausage, wieners & fried food

*Typical value

Data Collection

Data was collected from each location over a period of 5 days. Recruitment at the public health district office was voluntary. Health district employees informed visitors to the vital statistics office and the WIC office that a study was in progress and invited them to read the flyer and information sheet about the study and participate by filling out a survey if they were interested. The purpose and goals of the study, the risks and benefits to participants and

researchers, the inclusion criteria, confidentiality measures taken, and researcher contact information was provided via an information sheet (provided in English/Spanish). Consent to participate was implied if the survey was completed and returned to the health district employee. At the arts and education center, surveys were passed out by researchers at 1 family night-out event, 1 family nutrition class, and 1 after school program. Parents were provided with the same flyer and information sheet as described above.

Entry into a raffle for (2) \$25 local grocery store gift cards was the incentive for participation. Originally, the incentive was to be offered to all participants; however, because the PI was not present at the public health district office for data collection (at their request), raffle enrollment could not feasibly be carried out by office personnel. Thus, the gift card incentive was only offered at the arts and education center.

Data Analysis

Descriptive statistics were used to describe the characteristics of the sample. Pearson product moment correlations were used to determine the relationship between the food survey score, participant age, and number of children under 18 in the home. Point-biserial correlations were used to determine the relationship between government supplement receipt status and food survey score, participant age, and the number of children under 18 present in the house. Spearman's rank-order correlations were used to determine the relationship between food survey score and educational level and annual family income.

Results

A total of 238 surveys were collected. Twenty-four surveys were omitted because the participants' indicated age was less than 18 years, and 46 surveys were omitted because the participants did not indicate children less than 18 years old living in the household. The

remaining 168 survey participants met the inclusion criteria. Of the 168 included participants, 155 were from the public health district office and 13 from the arts and education center. The sample included primarily single, female parents, with a mean age of 32 years, who had finished high school or attended some college, and had an annual income of less than \$30,000.

Households typically consisted of 4 people with 2 children. Most of the participants reported purchasing their groceries at a local grocery store chain (93.5%) and 60% reported receipt of government food assistance (SNAP or WIC). *See Table 2 for demographics.*

Table 2. Demographic characteristics of the sample	
	Participants (N=168)
Age, years	32.46 ±10.829
Gender	
Female	142 (84.5)
Male	25 (14.9)
Marital status	
Single	93 (55.4)
Married	63 (37.5)
Divorced	9 (5.4)
Care taker status	
Parent	154 (91.7)
Grandparent	5 (3.0)
Legal Guardian	2 (1.2)
Other	4 (2.4)
Education	
Some High School	22 (13.1)
High School	56 (33.3)
Some College	70 (41.7)
Advanced Degree	19 (11.3)
Annual Family Income	
Less than \$15,000	67 (39.9)
\$15,001-\$30,000	51 (30.4)
\$30,001-\$45,000	12 (7.1)
Greater than \$45,000	37 (22.0)
Government supplement food status	
Yes	101 (60.1)
No	66 (39.3)
Number of people in household	4.23 ±1.38
Number of children less than 18 years old in house	2.29 ±1.26
Food survey score	5.18 ±0.93
Data presented as mean ± standard deviation or number of participants with percentages in parentheses.	

Correlations between variables indicated no significant relationship between government supplement food status and food score. There was however, a small but significant relationship between food score and level of education ($p = .188, p < .05$), as well as annual family income ($r = .195, p < .05$), and participant age ($r = .167, p = .05$).

	Food Score	Age	Education	Income	Children in home
Government Supplement Status	-.042	-.335**	-.274**	-.637**	.179*
Food Survey Score	--	.167*	.188*	.195*	-.016
Participant's age	--	--	.199**	.270**	-.115
Education Status	--	--	--	.568**	-.117
Annual Family Income	--	--	--	--	-.027

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

Discussion

This study found no significant relationship between participation in government food programs and the nutritional value of foods purchased in a sample of families residing in a South Texas community. Although we did not measure BMI, our findings are supported by the findings of several previous studies using large databases to compare the BMI of government food assistance recipients to non-recipients, which found no significant relationship between the two (Leung et al., 2013; Simmons et al., 2012; Ver Ploeg et al., 2008). Wilde et al. (2000) found that food stamp recipients consumed more meats, added sugars, and fats than non-recipients but the same amount of vegetables, fruits, and dairy. It is difficult to say if these findings agree or disagree with ours as we did not separate types or amounts of foods but measured an overall nutritional value score of all routine foods purchased.

Significant findings from this study included a positive but small correlation between level of education attained and nutritional value of foods routinely purchased. This may suggest that higher education or access to more nutrition information may increase the probability of purchasing and eating healthier foods. Molitor et al. (2015) found that adults and children who participated in the SNAP-Ed program ate less fast food and more fruits and vegetables than those who did not receive this education. Likewise, Koszewski, Sehi, Behrends, and Tuttle (2011) found that 25% of participants in a SNAP-Ed or an Expanded Food and Nutrition Education Program either maintained or improved the nutritional skills they learned during a 6-month follow-up period. This is promising news and supports the need to improve and expand on the nutrition education offered through government food assistance programs.

There were several limitations to this study. All of the survey data were self-reported which increased the risk of bias or the participant answering questions in such a way as to please the researchers. Some of the foods on the survey were items that are considered basic staples in the home (flour, milk, eggs, butter, vegetable oil, & sugar) and did not offer an ideal way of distinguishing between a healthy vs. non-healthy diet. Future studies should provide choices such as whole milk, 2% milk, or skim milk, for example. The butter, vegetable oil, and sugar were all classified as red items but knowledge of quantity consumed per week would have increased the ability to code them on a healthy vs non-healthy continuum. Another limitation was that some participants appeared to not complete the survey and that could affect the food survey score they received. The sample included some participants who were not classified as “low-income,” i.e. they reported greater than \$45,000 annual income (22%) and education at an advanced degree level (11%), which could have affected the correlational outcomes.

Conclusion

Childhood obesity in low-income children is a widespread problem in the US and in other countries around the world. The determination of whether government food programs contribute to this problem is of great importance as we strive to find ways to decrease the prevalence of this problem plaguing our nation's youth and threatening to overwhelm our health resources. The findings of this study indicate that government food programs may help provide adequate amounts of food to children but do not have an effect on the nutritional value of foods provided. The types of foods consumed are just as important as the amounts of food consumed in the prevention of obesity and its adverse health outcomes. The significant positive relationship between educational level and nutritional value of food may suggest that recipients of these government supplements should be strongly encouraged and supported in completing secondary education. In addition, they should also receive adequate and sustained nutritional education and guidance. Together these may be the best approaches to improving the consumption of nutritious foods resulting in decreased risk of overweight and obesity.

Implications for Practice

Nurses and other health care providers caring for low-income children and their families should include a thorough assessment of nutritional knowledge and habits. This may include the use of a 3-5-day dietary journal to obtain the big picture of the child's nutritional intake as well as their nutritional knowledge and that of their primary care taker. Inquiring as to whether or not the family participates in government food programs and strongly encouraging completion of secondary education and concurrent participation in the nutritional education offered by government programs is a must. Educating our youth and their families on the risks of poor dietary choices and the health benefits of healthy food and exercise could go a long way in decreasing the childhood obesity epidemic.

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