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RESEARCH ARTICLE

Diet Quality Over the Monthly Supplemental Nutrition Assistance Program Cycle

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Introduction: Supplemental Nutrition Assistance Program (SNAP) benefits, which are distributed monthly, help low-income families put food on their tables. Both food spending and caloric intake among recipients decrease over the month following benefit receipt. This pattern, termed the "SNAP-cycle," has serious implications for health and food security of low-income households. To understand better the SNAP-cycle, this study explored (1) differences in diet quality between SNAP and non-SNAP households and (2) the association between the SNAP-cycle and diet quality.

Methods: Multivariate linear regression with SNAP households in the U.S. Department of Agriculture's Food Acquisition and Purchase Survey to evaluate changes in diet quality as time from SNAP distribution increased. Diet quality of food purchases was measured by Healthy Eating Index–2010 total and component scores. Data were collected 2012–2013 and analyzed 2016–2017.

Results: Overall dietary quality was low throughout the SNAP-cycle (n=1,377, mean Healthy Eating Index 46.14 of 100). SNAP households had significantly lower Healthy Eating Index scores compared with eligible and ineligible nonparticipants ($p < 0.05$). After controlling for covariates, households in the final 10 days of the benefit cycle had Healthy Eating Index–2010 total scores 2.95 points lower than all other SNAP households (p=0.02). Significant declines in Healthy Eating Index fruit and vegetable scores contributed to worsening diet quality over the SNAP-cycle.

Conclusions: This study provides evidence of low dietary quality throughout the SNAP-cycle with significantly lower Healthy Eating Index scores in the final 10 days of the benefit month. This suggests less healthy purchasing occurs when resources are diminished, but overall that current SNAP levels are insufficient to consistently purchase foods according to dietary guidelines.
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INTRODUCTION

Food insecurity is a persistent problem in the U.S. that disproportionately impacts low-income, female-headed, and ethnic-minority households with children.[1] Nationally, 12.3% of households report food insecurity in the past year,[1] and despite fluctuations following the 2008 recession, this rate has shifted very little since the U.S. first measured domestic food insecurity in 1995.[2]

Food insecurity has negative dietary implications, including lower consumption of fruits and vegetables[3]; an increase in disordered eating (e.g., skipping meals)[4]; and reduced nutritional intake.[5,6] Food insecurity also has long-term health implications for mental health, cognitive development, and risk of diet-related chronic disease.[7–9]

One way the U.S. addresses food insecurity is through the Supplemental Nutrition Assistance Program (SNAP,

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formerly Food Stamps). More than 44 million people, or roughly one in seven Americans, received SNAP benefits in 2016. SNAP participants generally have lower overall diet quality compared with income-eligible and higher income nonparticipants[10]; however, national data suggest that food purchasing by SNAP households does not differ substantially from purchasing by non-SNAP households and that both groups buy foods inconsistent with the Dietary Guidelines for Americans (DGA).[11]

Although SNAP has been shown to improve very low food security by roughly one third,[12] some SNAP households still report times of food insecurity. Studies of SNAP participants showing a decrease in benefit expenditure on a monthly timescale have illustrated this periodic food insecurity.[13–16] SNAP benefits are distributed once per month, and systemwide assessments show that the majority of recipients spend most of their benefits within 2 weeks after receiving them, typically running out before the end of the month.[17] This monthly spending pattern is referred to as the "SNAP-cycle." Prior researchers have posited that increasing the frequency of SNAP benefit distribution could alleviate this cyclic spending pattern.[13,16]

The SNAP-cycle is associated with health and behavioral outcomes including hypoglycemia[18] and decreased testing scores among school-aged children.[19] The number of days since benefit distribution is also significantly negatively associated with calorie consumption, particularly among infrequent shoppers, and increases the likelihood of days without eating.[13,16,20,21] Others have found a U-shaped pattern in calorie and nutrient consumption with a dip in the middle of the SNAP-cycle, which may be attributable to the higher energy density of foods purchased when money is scarce.[22]

Despite common acknowledgment that a SNAP-cycle exists, longitudinal research exploring changes in dietary quality over this monthly timescale is limited. Among the few existing studies, results are mixed.[21,22] Additionally, limitations in the design of prior studies, such as single, 24-hour diet recall measures and small sample size, suggest that further inquiry is warranted. This study is the first to use a nationally representative data set of food purchasing to evaluate the association between the SNAP-cycle and dietary quality. The U.S. Department of Agriculture's (USDA's) National Household Food Acquisition and Purchase Survey (FoodAPS)[23] provides a full week of food purchasing data for each household, which offers a more robust measure of diet quality than prior studies.

The aims of this study are to assess (1) how diet quality of SNAP households compares with eligible and non-eligible households within FoodAPS, and (2) the association between the SNAP-cycle and dietary quality of food purchases. Addressing these questions may inform policy decisions regarding SNAP benefit distribution to improve the dietary quality of SNAP recipients.

METHODS

Study Sample

This study used FoodAPS to examine the relationship among SNAP recipient households between time since SNAP benefit receipt and the diet quality of food acquisitions (referred to as diet quality from this point on). FoodAPS was the first nationally representative survey of food purchasing and acquisition. Data were collected from 2012 to 2013 with a sample of 4,826 U.S. households (defined as all individuals who live together and share food, and who were present at the sampled address during the data collection week) at a range of income levels, including an oversampling of SNAP-eligible households.[23] SNAP participation was determined by self-report and administrative matching (both caseload and alert data) to confirm that households reporting being on SNAP were currently receiving benefits.

Participating households completed an initial survey and were then trained to record and scan all their food purchases and acquisitions to be consumed at home (FAH) and away from home for a 7-day period. Researchers also conducted a final household interview and collected information relevant to food purchasing behaviors including income, household composition, and demographic characteristics. Nutritional content tabulated post hoc included food group servings equivalents for each item, making the calculation of Healthy Eating Index–2010 (HEI-2010) scores possible. Analysis for this paper took place in 2016–2017 and used FAH nutrient data to evaluate the relationship between the SNAP-cycle and dietary quality.

Measures

When assessing mean HEI-2010 total and component scores, SNAP households were compared with eligible households not participating in SNAP (n=1,117) and non-eligible households (n=2,128). Non-eligible households were further divided for this analysis by (1) those households with income ≥185% of Federal Poverty Guidelines (FPL; n=1,792) and (2) those households with average income <185% FPL (n=336). SNAP eligibility was determined by using the indicator simulated in FoodAPS (Model Run 4) based on income, assets, and state-level eligibility guidelines.[23]

The primary predictor variable was the number of days since SNAP benefits were distributed (DSS), which was defined as the number of days between date of last reported SNAP disbursement and the last day of the data collection week (Figure 1). Therefore, households with DSS of 0–6 received their SNAP benefits during the data collection week, whereas a household with DSS=8 received their benefits 2 days prior to the start of their data collection week. For those households nearing the end of the benefit cycle at the time of the initial survey, it was assumed that they received their benefits on the same day the next month; therefore, their benefits would be renewed during the data collection week.

Primary outcome variables included diet quality of foods purchased, as measured by HEI-2010 scores applied to the full week of household purchases, total energy per person, as measured by total kilocalories/100 g, and total spending in dollars. The HEI-2010 was developed by