

5-4-2021

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Examining Characteristics of Children and Families that Utilize the US National School Lunch

Program: An Empirical Data Analysis

Kelsey Poirier Bernstiel

University of Southern Maine

Muskie School of Public Service

Capstone Final Product

May 4, 2021

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Abstract

The US National School Lunch Program (NSLP) provides meals at either free or reduced (\$0.40) priced cost to nearly 30 million children at schools across the country (USDA, National School Lunch Program, 2021). With school closures due to the COVID-19 pandemic, there is an increased risk of food insecurity for children that rely on the NSLP to provide them with meals. Understanding the demographic diversity of families that benefit from the NSLP may be helpful for school leaders and policymakers for providing resources and making future decisions regarding the NSLP during the pandemic. The purpose of this capstone is to identify and analyze characteristics that distinguish children and families that utilize the US NSLP from children and families that do not use the program. The analyses will be conducted using data from the 2015-2016 and 2017-2018 National Health and Nutrition Examination Survey (NHANES). The analyses were stratified by the child's age group. Sex, race, parental marital status, total number living in household, and mother's age when born were used as covariates. Logistic regression analyses show that NSLP participation is associated with being overweight for children age 5-11 in the 2017-2018 data cycle. No association between NSLP participation and overweight/obesity status was found for the 2015-2016 cycle. Regardless of federal guidelines set in place for nutritional quality of NSLP meals, participating in the NSLP does not appear to lower the risk of childhood obesity.

Introduction

Students across the United States rely on the NSLP to provide cost-friendly, nutritious meals that are easily accessible for a large number of students. Close to 99% of all public schools in the country participate in the NSLP, and these schools provide over 30 million children with free or reduced priced breakfast and/or lunches throughout the week (USDA, National School Lunch Program, 2019). The meals that are provided must meet federal guidelines for nutrition quality, but many meal choices are determined at the state level.

There are a number of qualifications that can make a child eligible to participate in the program. First, children identified as homeless, migrant, runaway, or foster qualify for participation. Children whose family participates in federal assistance programs, such as the Supplemental Nutrition Assistance Program (SNAP) and Temporary Assistance for Needy Families (TANF), also qualify. However, the family's income, as measured using the federal poverty level (FPL), is the primary qualification used for NSLP eligibility. Children of families with income at or below 130% FPL qualify for free lunch, while children of families with income between 130% and 185% FPL qualify for reduced price lunch (USDA, National School Lunch Program, 2021).

The COVID-19 pandemic has caused most schools in the country to transition to virtual learning at some point or another. One unintended consequence of this transition is the increased likelihood of food insecurity for children that rely on schools to provide them with meals. Student food insecurity is an issue during the summer months when there is no school, and virtual learning due to the pandemic has produced similar circumstances. This project therefore aims to examine the characteristics of children and their families that utilize the NSLP. Findings from this project may be informative to public school leaders and policymakers when making decisions regarding virtual learning and distribution of school lunches.

A second aim of this capstone is to estimate the association between NSLP participation and childhood overweight/obesity status. Many children participating in the NSLP are at a higher risk for being considered overweight or obese because poverty is an important risk factor for being

overweight/obese. Similar studies have analyzed the relationship between child BMI and food insecurity level and found no statistically significant results. However, when the same study stratified by NSLP participation, there was evidence to suggest that BMI and food insecurity were related (Nguyen et al., 2017). The results from this study have been duplicated in others. Briefel et al. (2009) found that students participating in the NSLP consume, on average, less low-nutrient, energy-dense foods while at school than they would at home. This is evidence to support the theory that NSLP participants are more likely to be overweight or obese, but not because of the meals they receive from the NSLP. Rather it is likely due to outside factors, such as the foods available to them outside of school. The analyses conducted for this project will examine BMI and NSLP participation while controlling for other factors that may be of interest, such as parental marital status and number of people in the household.

Previous studies of the characteristics of children in the NSLP have been limited. Many studies examined only select demographic characteristics in their analyses (household income, race/ethnicity, etc.). Others examined the relationship between students eating lunch at school and NSLP participation, or nutritional quality of meals for NSLP participants. A few studies examined NSLP participation and childhood overweight/obesity status but have not controlled for important demographic characteristics. Based on the gaps that were seen in the literature, there are two key questions that these analyses will attempt to answer:

- 1.) What demographic characteristics are more common among children and families that utilize the NSLP, compared to children and families that do not use the program?
- 2.) Is NSLP participation associated with childhood overweight/obesity status after controlling for demographic characteristics?

Methods

The analyses for this project were completed using data from the National Health and Nutrition Examination Survey (NHANES). This is a secondary data source that uses a cross-sectional study design to collect information from participants across the US. These data are publicly available, and there are no participant identifiers that are available in the public use data files. Data were used from the 2015-2016 and 2017-2018 cycles. These data cycles are the most recent, fully completed data that are available. Through NHANES, all participants and parents or legal guardians completed informed consent forms in order to grant permission to participate in the study.

Participants

In order to be eligible for this study, children had to be between the ages of 5 and 11 years old. Children under the age of 5 were excluded because it's unlikely that they have started school and therefore are not participating in the NSLP. Children over the age of 11 were excluded due to low general school lunch participation; preliminary analyses of NHANES data showed that there are far fewer students eating lunch at school after age 11. There are three hypothesized reasons for this; either the children are simply not eating lunch, they are bringing their own lunch and not eating lunches provided from the school, or (especially for the older students) they are leaving school to eat lunch. These reasons were used as justification for capping the study population at 11 years old. The study population also needed to attend a school that participates in NSLP, and they needed to answer all questions regarding school lunches and eating lunch at school. Children who attend schools that do not serve lunch, schools that do not participate in NSLP, or children that didn't answer questions regarding school lunch and NSLP were excluded. The total study population for the 2015-2016 analysis was 1,266 students, and the total study population for the 2017-2018 analysis was 1,026 students.

Exposure Variable

The exposure variable for these analyses was referred to as “NSLP” and originated from the variable DBQ390 in Diet, Behavior & Nutrition Questionnaire which asked, “Do you get lunch free, at a reduced price, or pay full price?” Those who answered that they get lunch for free or at a reduced price were grouped together and considered NSLP participants. For comparison, those who indicated that they paid full price for school lunch were considered non-NSLP participants. Those that refused to answer or indicated that they did not know if/how much they paid for lunch were coded as missing and excluded. In the 2015-2016 analysis, 811 students met inclusion criteria for free or reduced-price lunch. In the 2017-2018 analysis, 666 students met inclusion criteria for free or reduced-price lunch.

Outcome Variable

This study is examining the difference between NSLP participation and being overweight/obese. Since the study population for this analysis is children, categorization based on their body mass index (BMI) is not a reliable measure of a child’s status as being underweight, normal, overweight, or obese. Rather, children’s weight is classified using a calculation that considers height, weight, sex, and age in months to determine the child’s BMI percentile. This BMI percentile is then used to calculate obesity status, with children in the 85th percentile or above coded as “overweight/obese.” The “overweight/obese” variable was used as the outcome variable for the logistic regression analysis, to determine if there was an association between children participating in the NSLP and being overweight.

Covariates

The analysis for frequency distribution was stratified by age and broken into three age groups (5-6 years, 7-8 years, 9-11 years). Covariates for this analysis were sex (male or female), race/ethnicity (Non-Hispanic White, Non-Hispanic Black, Mexican American, Other Hispanic and Other Non-Hispanic), parental marital status (married/living with spouse, widowed/divorced/separated, never married), total number of people in household (ordinal, ranged from 2 people to 7+ people), household

income (0-130% FPL, 131-185% FPL, 186-500% FPL), and mothers age when born (14-19 years, 20-30 years, 31-40 years, 41+ years). These variables were chosen based on findings of the literature review. According to Kinderknecht et al. (2020), some of the variables have been shown to be associated with NSLP participation: sex, race, and household income. Based on gaps in the literature, other variables were expected or hypothesized to have an association with NSLP participation and childhood overweight/obesity status: parental marital status, total number of people in the household, and mothers age when born.

Statistical Analyses

Analyses for this study were conducted using SAS 9.4, with statistical significance set at $p < 0.05$. Descriptive statistics for the exposure variable, NSLP participation, were executed. The descriptive statistics provide the percentages and standard errors (SE) of each covariate, stratified by age, as the covariates relates to NSLP participation. In addition to the descriptive statistics, two logistic regression models were run to determine if there was an association between NSLP participation and being overweight, as well as NSLP participation and being overweight broken down by race/ethnicity. These models adjusted for sex, race/ethnicity, parental marital status, total number of people in the household, household income, and mothers age when born. The descriptive statistics and logistic regression models were conducted for the 2015-2016 data set as well as the 2017-2018 data set, for comparison.

IRB Considerations

Using the University of Southern Maine's Office of Research Integrity and Outreach (ORIO) website, a request for determination of research involving human subjects was submitted. A notice of evaluation was returned and resulted in a determination of non-human subject research.

Results

2015-2016

The 2015-2016 data shows fairly consistent numbers across age groups and sex. Approximately 64% of all students in the study population were NSLP participants. Distribution of sex was fairly uniform, and there were no differences seen between males and females. Differences in NSLP participation were seen by race/ethnicity groups. Non-Hispanic Black, Mexican American, Other Non-Hispanic, and Other Hispanic race/ethnicity groups are more common in the NSLP group than non-NSLP group. This is seen across all age groups. The Non-Hispanic White race/ethnicity category was more common in the non-NSLP group.

Children who have parents that are widowed, divorced, separated, or that have never been married are more common in the NSLP group. There are also more children in the NSLP group for households that have more than six people living in them. Children of families that have income less than 185% FPL, as well as mothers under the age of 30 years old are common in the NSLP group than the non-NSLP group. The percentages and standard errors of the frequency distribution for the demographic characteristics can be found in Table 1.

The odds ratio for an association between NSLP participation and being overweight or obese for the 2015-2016 study years was 0.94 (OR=0.94, 95% CI=[0.55, 1.66]). The association is not statistically significant because the p-value is greater than 0.05 ($p=0.8826$). We can conclude that there is no association between NSLP participation and being overweight/obese among 1,266 students age 5-11 years in the 2015-2016 data cycle. The odds ratio for an association between NSLP participation and being overweight after adjusting for income to poverty ratio is 0.83. In the 2015-2016 cycle, for every-one unit increase in poverty level (i.e. 100% FPL to 200% FPL), the adjusted odds ratio for being overweight/ obese in children age 5-11 was 0.83. Odds ratios, 95% confidence intervals, and p-values for 2015-2016 can be found in Table 2.

2017-2018

The frequency distribution for sex in the 2017-2018 cycle year was uniform as well. The total percentage of students who participate in the NSLP is the same (64%) as 2015-2016. The percentages for race/ethnicity, parental marital status, total number of people in the household, household income, and mothers age when born are all comparable to values seen in the 2015-2016 data. Results for NSLP participation in all age groups for household income in 2017-2018 are 57.0% (0-130% FPL), 18.4% (131-285% FPL), and 24.4% (186-500% FPL). We would expect to see a higher percentage of NSLP participation in the 0-130% group (because this is one criterion for free lunch) and a lower percentage in the 186-500% FPL group. These results are consistent with the results that are seen for 2015-2016 and pose the same question regarding high percentages in the 186-500% FPL group. The percentages and standard errors of the frequency distribution for the demographic characteristics can be found in Table 3.

Among the 1,026 students age 5-11 years old that were included in the 2017-2018 analysis, participating in the National School Lunch Program was associated with 1.57 increased odds of being considered overweight (85th percentile or higher for BMI) compared to those students who did not participate in the NSLP (OR= 1.57, 95% CI= [1.18, 2.08]). This association is statistically significant with a p-value of less than 0.05 (p=0.0042). The odds ratio for an association between NSLP participation and being overweight after adjusting for income to poverty ratio is 0.98. In the 2017-2018 cycle, for every-one unit increase in poverty level (i.e. 100% FPL to 200% FPL), the adjusted odds ratio for being overweight/ obese in children age 5-11 was 0.98. Odds ratios, 95% confidence intervals, and p-values for 2017-2018 can be found in Table 4.

Discussion

The results of the basic demographic characteristics were generally unsurprising. It was expected that the distribution of NSLP participation would be uniform around sex as well as some of the other variables. One unexpected result was seen in the frequency distribution for income to poverty level in both data cycles. Since income level in relation to the federal poverty level is one of the qualifications for NSLP, we would expect to see a large number of NSLP participants within the qualification range (0-130% FPL for free lunch, 131-185% FPL for reduced-price lunch). There was a substantial amount of NSLP participants from the 186-500% FPL range as well, which was unexpected. This indicates that one of two situations are occurring. One being that the students in this group are qualifying for the program in other ways (i.e. other federal assistance programs). The other being that some schools in the NHANES sample provide free lunch for all students through the program, regardless of income.

Only the 2017-2018 analysis found an association between NSLP participation and being overweight. Although there is an association between participating in the NSLP and being overweight for this cycle year, we cannot conclude that children are becoming overweight from the program. Rather, it is likely that participating in the NSLP and being overweight are both associated with another factor such as household income or poverty. Poverty is an important risk factor when considering overweight/obesity status. We know that students from families with lower household incomes are more likely to participate in NSLP and those same families are also more likely to be at risk for adverse health outcomes that are associated with food deserts, targeted marketing, and economic inequities.

The implications and conclusions of this study are important when considering school lunch distribution and virtual learning due to COVID-19, as well as how NSLP participation effects the health of students. Since there were not any notable differences in demographic characteristics among NSLP participants and non-NSLP participants, we cannot conclude that any particular demographic groups are more at risk for food insecurity during COVID-19. If anything, more resources should be provided to families of children that participate in NSLP to help encourage healthy eating at home. These resources

can also provide information about making healthy meals, finding access to fresh produce, and how to avoid fast food and other targeted marketing.

Limitations

The biggest limitation of this study is its lack of representation of older students. These analyses do not give us any information about students older than age 11 and their lunch eating habits. Older students may participate in the NSLP in different rates or may be more (or less) apt to have an association with overweight/obesity status. This is also a limitation because this study currently does not include findings from high-school aged children, which could produce varying results.

While research into the societal and financial effects of COVID-19 is surely in early stages, further research in this topic area would benefit from more COVID-19 specific information. It will be interesting to discover whether or not NHANES will include COVID-19 questions in future study years. Information about parental job losses, unemployment, and food insecurities during the pandemic would be beneficial for future studies in this topic area. A study that includes COVID-19 specific variables such as these would greatly add to the existing literature on NSLP participation and food insecurity during the pandemic.

Conclusion

In this analysis of secondary data from NHANES in 2017-2018, participating in the National School Lunch Program was associated with increased likelihood of being overweight for children age 5-11 years old. However, analysis from NHANES in 2015-2016 produced findings that show that there is no association between NSLP participation and being overweight/ obese in children age 5-11 years old. Other demographic characteristics were found to not show differences between NSLP participation and non-participation for race/ethnicity, parental marital status, number of people in the household, household income, and mothers age when child was born. Implications for findings from this study will be helpful for allocating NSLP resources and nutritional guidelines during the pandemic.

References

- Briefel, R.R., Wilson, A., & Gleason, P.M. (2009). Consumption of low-nutrient, energy-dense foods and beverages at school, home, and other locations among school lunch participants and nonparticipants. *Journal of the American Dietetic Association*, *109*(2), S79-S90.
<https://doi.org/10.1016/j.jada.2008.10.064>
- Kinderknecht, K., Harris, C., & Jones-Smith, J. (2020). Association of the healthy, hunger-free kids act with dietary quality among children in the US national school lunch program. *JAMA*, *324*(4), 359-368. <https://doi:10.1001/jama.2020.9517>
- Nguyen, B. T., Ford, C. N., Yaroch, A. L., Shuval, K., & Drope, J. (2017). Food Security and Weight Status in Children: Interactions With Food Assistance Programs. *American journal of preventive medicine*, *52*(2S2), S138–S144. <https://doi.org/10.1016/j.amepre.2016.09.009>
- U.S. Department of Agriculture Food and Nutrition Service. (2021). *National School Lunch Program*.
<https://www.fns.usda.gov/nslp>
- U.S. Department of Agriculture Food and Nutrition Service. (2019). *National School Lunch Program*.
<https://www.fns.usda.gov/nslp>

Tables and Figures

Table 1. Characteristics of Children Participating in the US National School Lunch Program (2015-2016).

% (SE)									
Characteristic	Total	Age							
		5-6		7-8		9-11			
		NSLP	Non-NSLP	NSLP	Non-NSLP	NSLP	Non-NSLP	NSLP	Non-NSLP
Number	1266	811	455	200	117	264	128	347	210
Sex									
Male		49.1 (2.0)	51.2 (3.1)	51.5 (3.8)	51.7 (5.1)	48.6 (3.7)	58.1 (4.6)	48.0 (2.4)	46.5 (3.5)
Female		50.8 (2.0)	48.7 (3.1)	48.4 (3.8)	48.2 (5.1)	51.3 (3.7)	41.8 (4.6)	51.9 (2.4)	53.4 (3.5)
Race/Ethnicity									
NH White		30.6 (4.9)	70.9 (4.5)	28.5 (5.0)	66.6 (7.0)	29.2 (5.1)	72.7 (5.4)	32.8 (5.7)	72.1 (4.0)
NH Black		23.0 (4.5)	5.6 (1.8)	24.1 (5.9)	6.1 (2.5)	24.9 (5.4)	5.8 (2.0)	21.0 (3.8)	5.4 (1.6)
Mexican American		24.6 (5.8)	7.0 (1.3)	26.7 (6.8)	8.6 (2.4)	25.4 (5.3)	6.1 (1.3)	22.9 (6.4)	6.7 (1.6)
Other NH		5.7 (1.8)	5.3 (1.1)	6.6 (2.0)	5.3 (1.6)	6.0 (1.7)	5.4 (2.5)	5.1 (2.3)	5.3 (1.0)
Other Hispanic		12.8 (1.3)	4.7(1.0)	21.1 (2.1)	5.8 (1.7)	12.4 (2.0)	4.1 (1.2)	13.5 (1.8)	4.5 (1.3)
Parental Marital Status									
Married/ Living w Partner		68.3 (3.3)	88.8 (2.8)	73.3 (4.4)	91.6 (2.5)	67.4 (3.6)	89.2 (3.6)	66.2 (4.0)	87.0 (3.8)
Wid./Div./Sep. ¹		17.9 (1.9)	9.5 (2.8)	10.3 (2.0)	4.0 (2.2)	18.7 (2.8)	9.9 (3.5)	21.6 (2.9)	12.2 (3.7)
Never Married		13.6 (2.1)	1.5 (0.6)	16.3 (3.0)	4.2 (2.0)	13.8 (2.0)	0.8 (0.6)	12.0 (2.6)	0.6 (0.3)
Total Number in HH									
2		2.0 (0.5)	1.2 (0.4)	2.8 (1.2)	1.4 (0.8)	1.4 (0.7)	2.1 (1.2)	2.1 (0.7)	0.6 (0.4)
3		10.2 (2.2)	13.3 (2.4)	9.8 (2.0)	10.5 (3.9)	15.6 (3.2)	12.6 (3.7)	10.2 (2.2)	15.2 (2.9)
4		22.6 (2.6)	41.4 (3.8)	27.8 (3.4)	44.0 (6.7)	21.4 (1.9)	44.0 (5.5)	22.6 (2.6)	38.5 (3.6)
5		26.3 (2.6)	27.2 (3.0)	20.3 (2.6)	28.1 (3.9)	23.4 (2.3)	27.8 (3.0)	26.3 (2.6)	26.4 (4.9)
6		22.7 (2.4)	9.8 (2.4)	20.0 (2.8)	9.7 (3.9)	20.7 (3.7)	10.7 (4.0)	22.7 (2.4)	9.2 (2.3)
7+		16.0 (2.1)	6.8 (2.1)	18.9 (2.2)	6.0 (3.1)	17.2 (3.3)	2.4 (0.9)	16.0 (2.1)	9.8 (3.2)
Household Income									
0-130% FPL		53.4 (2.8)	6.1 (1.2)	53.2 (4.0)	7.2 (2.6)	54.9 (4.6)	5.8 (2.2)	52.4 (3.1)	5.8 (1.3)
131-185% FPL		21.4 (2.1)	5.3 (1.0)	14.5 (2.8)	8.4 (2.2)	24.3 (2.9)	3.0 (1.3)	23.1 (3.0)	5.1 (1.2)
186-500% FPL		25.1 (2.0)	88.4 (1.7)	32.2 (3.2)	84.2 (3.3)	20.7 (3.2)	91.0 (2.5)	24.4 (2.2)	88.9 (1.5)
Mothers Age When Born									
14 to 19 years		14.7 (1.6)	3.5 (1.1)	14.6 (2.7)	4.7 (2.2)	13.9 (3.0)	6.4 (2.6)	15.5 (2.2)	1.3 (0.4)
20 to 30 years		66.2 (2.0)	51.1 (3.7)	65.4 (3.4)	49.3 (9.6)	69.2 (2.1)	50.1 (5.2)	64.4 (3.9)	52.5 (3.9)
31 to 40 years		18.4 (2.0)	44.5 (3.4)	19.2 (3.2)	45.0 (6.2)	16.8 (2.5)	42.7 (4.8)	19.0 (3.2)	45.3 (3.6)
41 to 45 years		0.5 (0.2)	0.7 (0.3)	0.5 (0.3)	0.8 (0.5)	0.0 (0.0)	0.6(0.5)	0.9 (0.4)	0.7 (0.5)

SE=standard error

NH=non-Hispanic

FPL=federal poverty level

¹ Widowed/Divorced/Separated

Table 2. The association between NSLP participation and body mass index among 1266 children in the National Health and Nutrition Examination Survey, 2015-2016.

Predictor	Odds Ratio	95% CI	p-value
Model 1 NSLP			
<i>Yes</i>	1.59	[1.08, 2.33]	0.0198
<i>No</i>	Reference		
Model 2 NSLP			
<i>Yes</i>	0.96	[0.55, 1.66]	0.8826
<i>No</i>	Reference		
Race/Ethnicity			
NH White	Reference		
NH Black	1.15	[0.72, 1.82]	0.4793
Mexican American	1.79	[1.32, 2.42]	0.0031
Other NH	1.51	[0.74, 3.07]	0.4475
Other Hispanic	1.37	[0.89, 2.11]	0.5383
Sex			
Male	1.35	[1.06,1.72]	0.0170
Female	Reference		
Marital Status			
Married/			
Living w partner	0.96	[0.60, 1.54]	0.9252
Wid./Div./Sep. ¹	Reference		
Never Married	0.89	[0.47, 1.67]	0.7189
ITP ratio	0.83	[0.67, 1.02]	0.0766
Moms age when born	1.00	[1.00, 1.00]	0.0283

CI=confidence interval

NH=non-Hispanic

¹Widowed/Divorced/Separated

ITP=income to poverty

Table 3. Characteristics of Children Participating in the US National School Lunch Program (2017-2018).

		% (SE)							
				Age					
Characteristic	Total	NSLP	Non-NSLP	5-6		7-8		9-11	
				NSLP	Non-NSLP	NSLP	Non-NSLP	NSLP	Non-NSLP
Number	1026	666	360	160	74	189	167	317	175
Sex									
Male		50.4 (2.0)	50.0 (4.1)	46.9 (4.2)	50.0 (6.5)	49.0 (3.7)	61.7 (5.7)	53.0 (2.5)	42.6 (6.4)
Female		49.5 (2.0)	49.9 (4.1)	53.0 (4.2)	49.9 (6.5)	50.9 (3.7)	38.2 (5.7)	46.9 (2.5)	57.3 (6.4)
Race/Ethnicity									
NH White		32.3 (4.5)	67.0 (5.0)	39.7 (5.7)	61.3 (8.6)	30.6 (5.2)	68.0 (7.9)	29.2 (5.1)	68.5 (4.4)
NH Black		20.5 (3.5)	5.8 (1.5)	18.9 (4.6)	6.0 (2.9)	21.7 (4.9)	6.4 (1.7)	20.7 (3.7)	5.3 (1.6)
Mexican American		25.7 (4.3)	7.8 (1.1)	22.9 (6.5)	5.6 (2.4)	25.9 (4.3)	7.2 (2.4)	27.1 (4.5)	9.0 (2.0)
Other NH		7.8 (1.4)	7.9 (2.4)	6.7 (1.4)	6.0 (1.4)	7.1 (1.9)	6.4 (2.8)	8.8 (2.0)	8.6 (2.8)
Other Hispanic		11.4 (1.7)	4.6 (1.3)	9.8 (2.5)	8.6 (3.5)	11.2 (1.7)	7.9 (2.1)	12.4 (2.1)	2.7 (1.3)
Parental Marital Status									
Married/									
Living w Partner		67.4 (3.6)	81.7 (3.5)	68.3 (7.4)	82.6 (7.1)	72.3 (3.8)	81.5 (4.4)	64.1 (3.2)	81.4 (4.6)
Wid./Div./Sep. ¹		17.0 (2.0)	13.0 (3.2)	15.3 (3.9)	12.0 (6.7)	12.4 (2.4)	13.5 (4.5)	20.7 (2.7)	13.1 (3.8)
Never Married		15.4 (3.0)	5.1 (1.9)	16.3 (5.1)	5.3 (3.2)	15.2 (3.3)	4.8 (2.5)	15.0 (2.8)	5.3 (2.2)
Total Number in HH									
2		3.6 (0.5)	3.7 (1.4)	4.3 (2.0)	3.9 (2.9)	2.8 (1.2)	1.7 (1.1)	3.6 (1.1)	4.8 (2.1)
3		12.5 (1.3)	18.8 (3.2)	9.4 (1.6)	15.6 (5.9)	11.4 (3.4)	21.9 (4.4)	14.9 (1.8)	18.2 (3.0)
4		21.5 (2.1)	41.4 (3.9)	26.8 (5.0)	38.2 (6.0)	17.7 (3.6)	40.0 (7.0)	20.9 (2.1)	43.5 (3.4)
5		27.7 (1.6)	23.4 (3.0)	25.5 (3.1)	28.9 (5.0)	27.0 (2.2)	19.3 (4.1)	29.2 (2.6)	23.9 (3.9)
6		18.3 (2.5)	9.9 (1.9)	18.7 (4.6)	11.5 (3.5)	19.9 (4.0)	13.2 (5.5)	17.1 (2.3)	7.3 (1.5)
7+		16.1 (1.8)	2.5 (0.6)	14.9 (3.4)	1.6 (1.2)	20.9 (3.1)	3.6 (2.0)	14.0 (1.8)	2.1 (0.6)
Household Income									
0-130% FPL		57.0 (3.3)	5.0 (1.1)	56.2 (4.1)	9.9 (4.1)	62.2 (3.9)	4.6 (1.8)	54.5 (4.1)	3.3 (1.0)
131-185% FPL		18.4 (3.3)	5.9 (1.3)	16.2 (3.7)	6.0 (2.6)	19.1 (4.9)	8.4 (2.4)	19.1 (3.2)	4.3 (0.8)
186-500% FPL		24.4 (3.2)	89.0 (1.9)	27.4 (3.9)	83.9 (4.9)	18.5 (4.7)	86.9 (3.1)	26.2 (3.3)	92.2 (1.3)
Mothers Age When Born									
14 to 19 years		15.8 (1.7)	2.8 (1.2)	16.4 (4.4)	2.4 (1.6)	17.1 (3.1)	3.7 (2.0)	14.7 (2.1)	2.5 (1.4)
20 to 30 years		66.3 (1.6)	55.3 (3.6)	66.4 (5.3)	52.0 (5.6)	69.0 (3.5)	61.6 (8.4)	64.7 (1.9)	52.8 (3.9)
31 to 40 years		16.6 (1.6)	39.0 (3.9)	16.8 (3.1)	41.0 (6.8)	12.9 (2.0)	33.4 (7.8)	18.7 (1.7)	41.5 (3.9)
41 to 45 years		1.1 (0.4)	2.7 (1.0)	0.3 (0.3)	4.4 (3.2)	0.8 (0.4)	1.1 (1.0)	1.8 (0.8)	3.0 (1.9)

SE=standard error

NH=non-Hispanic

FPL=federal poverty level

¹ Widowed/Divorced/Separated

Table 4. The association between NSLP participation and being overweight among 1026 children in the National Health and Nutrition Examination Survey, 2017-2018.

Predictor	Odds Ratio	95% CI	p-value
Model 1 NSLP			
<i>Yes</i>	1.74	[1.23, 2.45]	0.0037
<i>No</i>	Reference		
Model 2 NSLP			
<i>Yes</i>	1.57	[1.18, 2.08]	0.0042
<i>No</i>	Reference		
Race/Ethnicity			
NH White	Reference		
NH Black	0.95	[0.66, 1.38]	0.6055
Mexican American	1.34	[0.82, 2.17]	0.0264
Other NH	0.75	[0.37, 1.52]	0.5817
Other Hispanic	0.99	[0.54, 1.83]	0.5686
Sex			
Male	1.00	[0.72, 1.45]	0.9571
Female	Reference		
Marital Status			
Married/			
Living w partner	1.21	[0.63, 2.30]	0.5591
Wid./Div./Sep. ¹	Reference		
Never Married	1.12	[0.56, 2.25]	0.9200
ITP ratio	0.98	[0.84, 1.13]	0.7973
Moms age when born	1.00	[1.00, 1.00]	0.0508

CI=confidence interval

NH=non-Hispanic

¹ Widowed/Divorced/Separated

ITP=income to poverty

Figure 1. Frequency of NSLP participation by age group, 2015-2016.

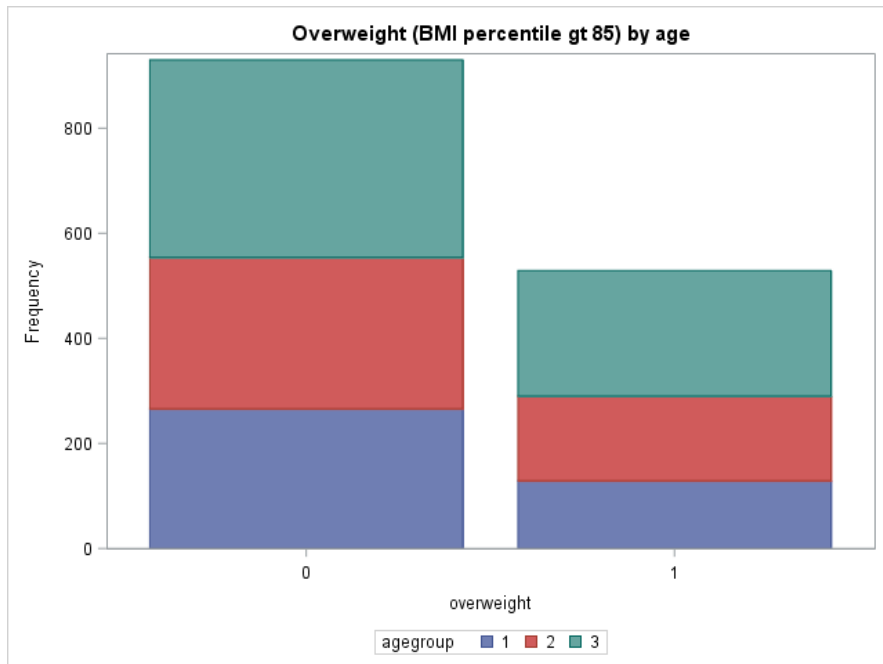


Figure 2. Frequency of students classified as being Overweight by age group, 2015-2016.

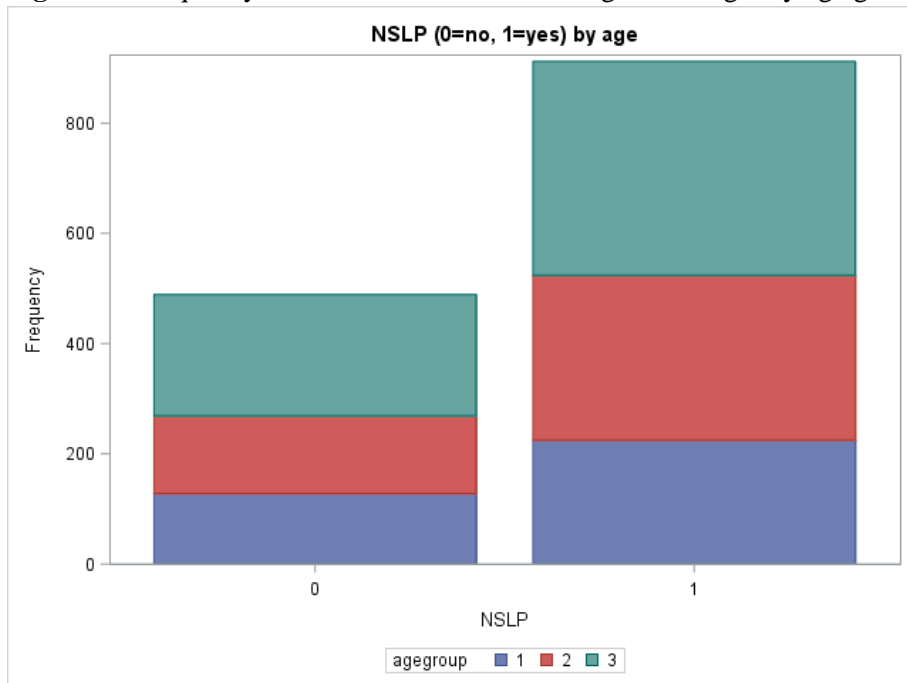
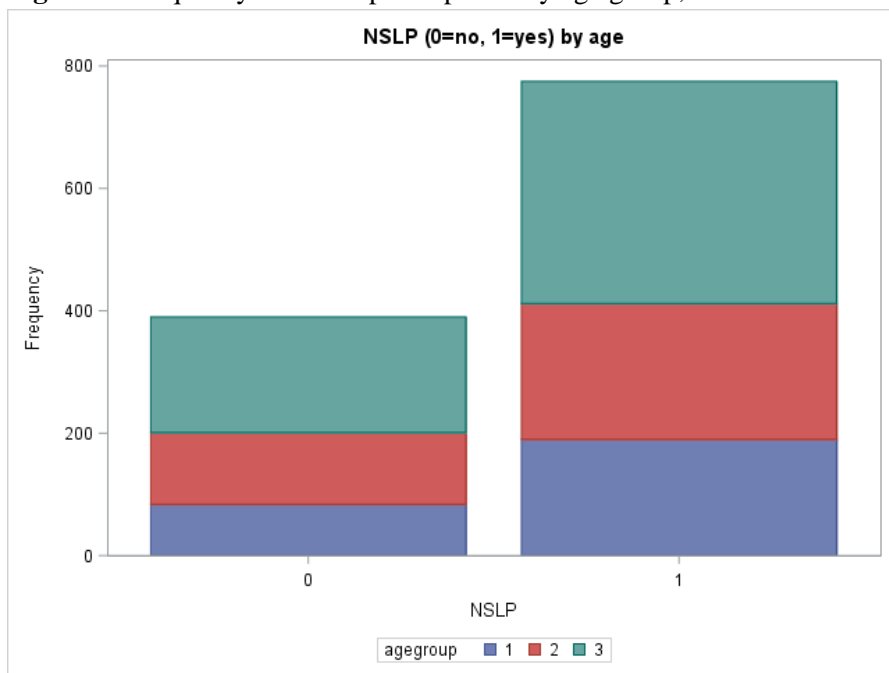


Figure 3. Frequency of NSLP participation by age group, 2017-2018.**Figure 4.** Frequency of students classified as being Overweight by age group, 2017-2018.