

**ASSESSING DISPARITIES IN PENNSYLVANIA SCHOOLS' READINESS FOR
FEDERAL SCHOOL LOCAL WELLNESS POLICY REGULATIONS**

by

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ABSTRACT

Background: Child obesity is a significant public health problem in the U.S. In 2012, 31.8% of U.S. children were overweight or obese, and 17% were obese. Additionally, minority, low-income, and rural children are more likely to be overweight or obese compared to their white, wealthier, and urban/suburban counterparts. Additionally, child obesity increases one's risk for heart disease, diabetes, and other serious chronic conditions later in life. Despite persistent disparities in child obesity, however, few studies have examined relationships between school-level demographic factors and evidence-based obesity prevention policies.

Methods: I merged data from the 2014 CDC School Health Profiles Study with 2013-2014 National Center for Education Statistics demographic data for Pennsylvania public schools. Descriptive statistics were used to determine prevalence of evidence-based obesity prevention practices, and multivariable logistic regression were used to determine: a) Prevalence of evidence-based obesity prevention practices and b) Disparities in such practices by school-level urbanicity, socioeconomic status (SES), and racial/ethnic composition.

Results: Schools with higher proportions of minority and low-income students had fewer evidence-based practices, although these associations were not statistically significant. Schools with >20% minority students had nearly 3 times greater odds of classroom physical activity breaks compared to schools with <6% minority students (OR: 2.96, p=0.03), but lower odds of interscholastic sports (OR: 0.161, p=0.02). Schools with >50% low-income students reported

lower odds of offering salad bars compared to schools with <33% low-income students (OR: 0.388, $p=0.01$).

Conclusions: Many Pennsylvania secondary schools are not implementing evidence-based practices, and demographic factors are associated with some nutrition and physical activity practices. Schools may need assistance from advocacy organizations and Pennsylvania education and health agencies to implement evidence-based interventions to significantly reduce child obesity and related disparities

TABLE OF CONTENTS

1.0	INTRODUCTION.....	1
1.1	PREVIOUS LITERATURE	2
1.1.1	Urbanicity	2
1.1.2	Socioeconomic Status.....	2
1.1.3	Race and ethnicity.....	3
1.2	RESEARCH GAPS	4
1.3	NATIONAL SCHOOL WELLNESS POLICY	4
1.4	RESEARCH AIMS.....	5
2.0	METHODS	7
2.1	DATA	7
2.2	MEASURES	7
2.2.1	Outcomes	7
2.2.2	Independent variables	9
2.3	DATA ANALYSIS.....	10
3.0	RESULTS	11
3.1	SCHOOL CHARACTERISTICS	11
3.2	BIVARIATE ANALYSIS	18
3.2.1	Nutrition Promotion	18

3.2.2	Physical Activity Promotion.....	19
3.3	MULTIVARIABLE ANALYSIS	20
4.0	DISCUSSION	23
5.0	LIMITATIONS	26
6.0	CONCLUSIONS	27
7.0	IMPLICATIONS FOR SCHOOL HEALTH.....	28
7.1	PUBLIC HEALTH RELEVANCE	29
	APPENDIX A: ADDITIONAL TABLES.....	31
	APPENDIX B: FIGURES	35
	BIBLIOGRAPHY.....	37

LIST OF TABLES

Table 1. Demographic Characteristics of Pennsylvania Secondary Schools - School Health Profiles, 2014	12
Table 2. Percentage of Schools with Selected School Health Practices – Pennsylvania School Health Profiles Study, 2014	13
Table 3. Percentages of schools with selected nutrition promotion practices by subcategory	15
Table 4. Percentages of schools with selected physical activity promotion practices by subcategory	17
Table 5. Adjusted odds ratios for nutrition-related policies and practices by school type, percentage of low-income students, percentage of minority students, and school location	21
Table 6. Adjusted odds ratios for physical activity-related policies and practices by school type, percentage of FRPL-eligible students, percentage of minority students, and school location	22
Table 7. Comparison 2004 CNRA and 2014 HHFKA local wellness policy requirements	31
Table 8. Comparison of federal nutrition and physical activity-related local wellness policy requirements and related School Health Profiles questions	33

LIST OF FIGURES

Figure 1. Adjusted odds ratios for nutrition promotion practices by percentage of low-income students	35
Figure 2. Adjusted odds ratios for nutrition promotion practices by percentage of minority students	35
Figure 3. Adjusted odds ratios for physical activity promotion practices by percentage of low-income students.....	36
Figure 4. Adjusted odds for physical activity promotion practices by percentage of minority students	36

1.0 INTRODUCTION

Child obesity has recently become a major issue of public health significance. Child obesity rates have doubled over the past 30 years, adolescent obesity rates have quadrupled, and the U.S. has some of the highest child obesity rates in the world.¹ According to the most recent National Health and Nutrition Examination Survey, 13.9% of children ages 2-19 are overweight or obese, and 17% of children are obese. As of 2011, 13.5% of Pennsylvania children ages 10-17 were obese.² Additionally, there are significant racial/ethnic disparities in overweight and obesity, with significantly higher prevalence of obesity in Hispanic and black youth compared to white youth.³ Research also shows that rural children and children from low-income households and neighborhoods significantly more likely to be obese compared to urban and higher-income children⁴. According to the Youth Risk Behavior Surveillance System, a series of surveys conducted by the Centers for Disease Control and Prevention (CDC), 10.5% of non-Hispanic white adolescents were obese in 2013 compared to 14.7% of non-Hispanic African-American adolescents and 16.3% of Hispanic adolescents.⁵

Child obesity significantly increases the risks of a variety of health issues later in life. Obese children are at greater risk for development of type 2 diabetes, hypertension and high cholesterol, both of which are risk factors for heart disease.⁶ They also suffer disproportionately from psychological stress, low self-esteem, and lower reported quality of life. Obese children are significantly more likely to become obese adults, and obesity in adulthood is associated with a variety of health conditions, including heart disease, diabetes, and cancer.⁴

Children and adolescents spend a significant portion of their time in school, and the national Monitoring the Future study of child and adolescent health found that secondary schools with high minority enrollment or low parental education are more like to have students with disproportionately high body weight.⁷

However, research is limited on how school-level demographic factors are associated with the quality and presence of school nutrition and physical activity practices. Below, I briefly review the literature on the association between schools' urbanicity, socioeconomic status, and racial/ethnic composition and schools' wellness policies and practices.

1.1 PREVIOUS LITERATURE

1.1.1 Urbanicity

Overall, there is some evidence that rural schools have fewer evidence-based nutrition and physical activity-related policies and practices in place compared to urban and suburban schools. Several recent studies have found that urban and suburban schools had more evidence-based nutrition promotion and nutrition services practices in place, including a 2012 national study by Turner and Chaloupka of 1,830 public and private elementary schools.⁸ However, a 2010 CDC study of a nationally representative sample of Catholic, and private schools at all grade levels found no significant relationships between school-level demographic factors and nutrition and physical activity-related practices.⁹

1.1.2 Socioeconomic Status

Findings on the relationship between student body socioeconomic status (SES) and the quality and presence of obesity-related school policies and practices are also mixed. These studies generally use the proportion of students eligible for or enrolled in free or reduced-price lunch under the National School Lunch Program to determine student body socioeconomic status. Overall, schools with higher percentages of students eligible for free and reduced-price lunch appear to be less likely to offer a variety of healthy food options for lunch, and some studies indicate they are more likely to offer more low nutrient, energy-dense options.^{10,11,12} However, other studies, including national and Minnesota-based research, found little or no relationship between the proportion of students eligible for free and reduced-price lunch and the number and presence of recommended nutrition and physical activity policies.^{9,11,13} These findings are complicated by the fact that some studies used the percentage of students *eligible* for free and reduced-price lunch as the measure of low-income students, while other studies used the percentage of students *enrolled* in free and reduced-price lunch programs. According to 1996 USDA data, less than three-quarters of students eligible to receive free or reduced-price lunch acquire the necessary certification to do so.¹⁴ Using the percentage of students who are enrolled rather than eligible likely underestimates school poverty levels and may contribute to the mixed findings. One study using survey data on a cohort of kindergartners at two time points (fifth and eighth grade) found that the relationship between school-level socioeconomic status and nutrition and physical activity policies appeared to differ by grade level and type of food.¹⁵ In fifth grade, overall food environments were relatively equal across socioeconomic tertiles, although there were differences in availability of specific food groups. At the fifth grade time-

point, high-SES schools tended to sell more of all types of food groups, both healthy and unhealthy. In eighth grade, however, high-SES schools tended to have a healthier overall food environment. To explain this, the authors point to a finding from a national, non-peer-reviewed study by the University of Michigan Bridging the Gap Research program that food and beverage policies tend to be more restrictive at lower grades compared to higher grades.¹⁶

Little research has been conducted on the relationship between student body socioeconomic status and the presence of quality physical activity promotion practices. A study by Nanney, Bohner, and Friedrichs found that schools with a high proportion of students eligible for free and reduced-price lunch (> 45%) were less likely to offer intramural sports or physical activity clubs compared to schools with a relatively low proportion of low-income students (0-30%).¹⁷ However, Balaji et al 2010 found no meaningful relationships between the proportion of students eligible for free and reduced-price lunch and offering intramural sports or sharing recreational facilities through joint use agreements. While a large study of public schools in North Carolina initially found that schools with a higher proportion of FRPL-eligible students were less likely to share recreational facilities with community members, students, and organizations outside of school hours, this association was attenuated after adjusting for school level, the percentage of African-American students, and the economic stability of the surrounding county.¹⁸

1.1.3 Race and ethnicity

Studies generally appear to find no consistent relationship between student body racial/ethnic composition and expert-recommended nutrition and physical activity policies. Two national studies found no significant differences in the quality and presence of nutrition and physical activity practices by racial/ethnic composition, nor did the 2015 Minnesota study by Caspi et al.^{8,9,119} As mentioned above, a North Carolina study found that North Carolina schools with a higher percentage of minority students were less likely to share recreational facilities with community members and organizations in North Carolina schools, while Nanney et al 2013 found that a higher percentage of minority students was associated with banning advertising for LNEF foods in a greater number of school locations in a sample of secondary schools from 28 states.²⁰

1.2 RESEARCH GAPS

To this author's knowledge, there is no nationally representative study that examines a full range of expert-recommended physical activity, nutrition services and nutrition promotion strategies and effects of socioeconomic and demographic variables. While nearly all studies on this topic use survey data from school administrators to determine both demographic factors and school obesity-related policies, the studies vary widely in sample size and the geographic area sampled (state, nationally representative, etc.). Additionally, the studies vary widely in the specific nutrition and physical activity practices that they examine and do not provide a full picture of potential significant relationships between demographic factors and obesity-related practices. Furthermore, studies vary in measures used to determine student body socioeconomic status – while most studies used eligibility for free and reduced-price lunch, one study instead used *enrollment* in the school's free and reduced-price lunch programs.²¹ Since not all students eligible for free and reduced-price may actually be enrolled in the program, this choice of a measure could underestimate the proportion of low-income students in the school. While not discussed in detail above, a 2007 study by Delva, O'Malley, and found that effects of demographic factors on school obesity prevention policies may differ by school type (high, middle, and elementary), and this may be an area that needs future research.⁷

1.3 NATIONAL SCHOOL WELLNESS POLICY

In 2010, Congress passed the Healthy, Hunger-Free Kids Act (HHFKA), which, among other provisions, updated nutrition standards for school and lunch and breakfast programs to reflect the most recent Institute of Medicine Food and Nutrition Board recommendations.²² The law also establishes more stringent requirements for school wellness policies. Specifically, every public local education agency is required to: a) set goals for nutrition promotion and education, physical activity, and other school-based wellness activities; b) establish nutrition guidelines for all foods served on school campuses during the school day; c) involve the local community in developing, implementing, and reviewing the policy; d) establish a method for public notification regarding policy content and implementation; and e) delegate one or more local education agency or school officials to oversee compliance with the local wellness policy.

Although previous federal law had required school local wellness policies to include goals for nutrition education, physical activity, and other school wellness activities, the Healthy, Hunger-Free Kids

Act marks the first time schools have been required to include goals for nutrition promotion. The U.S. Department of Agriculture (USDA) issued a proposed rule in February 2014 further outlining nutrition and physical activity practices schools can implement to meet the new requirements; however, a final rule has not yet been issued. Schools are “required to review and consider evidence-based strategies and techniques in establishing goals for nutrition promotion and education, physical activity, and other school based activities that promote student wellness.”¹ The proposed rule goes on to outline a variety of evidence-based nutrition and physical activity promotion practices that schools can implement to meet this requirement, including Smarter Lunchroom strategies that utilize behavioral economics principles to increase the likelihood that students will choose healthy food options, developing joint use agreements that enable community organizations and members to use school recreational facilities outside of school hours, and offering intramural sports. The practices suggested by USDA are shown in Table 7 of the Appendix.

New federal regulations have the potential to reduce child obesity and disparities by requiring that all public schools specify in writing evidence-based nutrition and physical activity promotion strategies that they will implement to improve child health outcomes. Some of these interventions cost little or no money or time to implement, such as behavioral economic strategies in which fruits and vegetables are labeled with catchy names or placed near the cafeteria cashier to promote purchase, or implementing ten-minute physical activity breaks in classrooms. The affordable nature of these interventions may allow them to be implemented across schools regardless of financial resources. Others, such as pricing healthy foods below healthier foods, are more costly and may not be feasible for implementation by many schools.

1.4 RESEARCH AIMS

This study aims to a) examine prevalence of physical activity and nutrition promotion practices among Pennsylvania public middle and high schools that are consistent with new federal requirements and b) determine if disparities in the prevalence of recommended school nutrition and physical activity-related practices exist according to schools’ sociodemographic factors. This research can help to determine whether disparities exist in Pennsylvania secondary school students’ exposure to healthy school environments, which could in turn exacerbate current socioeconomic, racial/ethnic, and geographic disparities in child obesity.

This study will inform future research evaluating the effects of the Healthy, Hunger-Free Kids Act, provide important baseline information for policymakers as the rule is being implemented, and identify characteristics of schools that may need additional assistance to meet local wellness policy requirements.

2.0 METHODS

2.1 DATA

Data on school nutrition and physical activity policies were obtained from the 2014 Pennsylvania School Health Profiles principal survey, which is administered by the Pennsylvania Department of Education with funding and technical assistance from the CDC. The researcher obtained the 2014 School Health Profiles for Pennsylvania upon request from the Pennsylvania Department of Education. The School Health Profiles is a biennial system of state-representative surveys assessing public middle and high school health policies and practices in U.S. states, large urban school districts, and territories.²³ The principal survey is mailed to a random sample of public secondary school principals in each state. For the 2014 study, 450 schools were sampled, and 440 of the surveys returned were eligible. Out of the eligible principals, 352 returned surveys, yielding a response rate of 80%. For this study, we examined only schools that provided answers for all variables of interest described below. Thus, the final sample size for this study is 318 schools, which is equivalent to 90% of the School Health Profiles study sample of 352 and 72% of the 440 eligible principal surveys.

2.2 MEASURES

2.2.1 Outcomes

The analysis includes 11 measures of nutrition promotion practices and five measures of physical activity promotion practices that have demonstrated effectiveness in increasing physical activity and healthy eating in the scientific literature and align with practices schools can implement to meet the proposed USDA regulations discussed above.²³ Many of these practices are also contained in the CDC

School Health Guidelines to Promote Healthy Eating and Physical Activity.²⁴ Table 7 in the Appendix illustrates how the School Health Profiles align with the USDA local wellness policy requirements.

Practices examined included: whether the school a) priced nutritious foods and beverages at a lower cost while increasing the price of less nutritious foods and beverages, b) collected suggestions from students, families, and school staff on nutritious food preferences and strategies to promote healthy eating, c) Provided information to students or families on the nutrition and caloric content of foods available, d) Conducted taste tests to determine food preferences for nutritious items, e) Provided opportunities for students to visit the cafeteria to learn about food safety, food preparation, or other nutrition-related topics, f) Served locally or regionally grown foods in the cafeteria or classrooms, g) Planted a school food or vegetable garden, h) Placed fruits and vegetables near the cafeteria cashier, where they are easy to access, i) Used attractive displays for fruits and vegetables in the cafeteria, j) Offered a self-serve salad bar to students, or k) Labeled healthful foods with appealing names (e.g., crunchy carrots). Response options were “Yes/No” for all questions. For analysis purposes, “Yes” was coded as “1” while “No” was coded as “0.”

To facilitate analysis of the large number of nutrition promotion variables, the 11 strategies were condensed into three binary measures of: (1) Economic Strategies (pricing healthy foods at a lower price than unhealthy foods, using attractive displays for fruits and vegetables, and labeling healthful foods with appealing names; (2) Educational Strategies (providing nutritional and caloric information, providing opportunities for students to visit the school cafeteria, and engaging students in food and vegetable gardening); and (3) Community Engagement Strategies (serving local or regional foods, conducting taste tests, and collecting suggestions on food preferences and strategies to promote healthy eating). Each of these measures was coded as 0 or 1, with 0 indicating that the school did not report using any of the practices in the category and 1 indicating that the school reported using at least one of the practices in the category. For example, if a school reported using attractive displays for fruits and vegetables, labeling healthy foods with appealing names, or pricing healthy foods at a lower price, Economic Strategies would be coded as “1”. If a school used none of these three practices, Economic Strategies would be coded as “0.”

Using attractive displays for fruits and vegetables and labeling healthful foods with appealing names were included along with pricing strategies in Economic Strategies because both are strategies that use theories and constructs from behavioral economics to increase the likelihood that students will purchase fruits and vegetables.⁷ Providing nutritional and caloric information, providing opportunities for students to visit the school cafeteria, and engaging students in food and vegetable gardening were labeled Educational Strategies because all three items educate students about how produce is grown, harvested, prepared, and cooked and/or provide students and other stakeholders with information that can help

individuals make more informed food choices. Serving local food, conducting taste tests, and soliciting suggestions relating to food preferences were deemed Community Engagement strategies because these strategies aim to promote healthy food consumption by engaging stakeholders in school food practices, including local fruit and vegetable producers. The variable for presence of a salad bar was analyzed separately because it was not highly correlated with variables in any of the other three categories. Bivariate and multivariate analyses were conducted on each individual nutrition item as well as on the condensed categories.

Five physical activity promotion practices were examined as five binary measures: whether a) students participate in physical activity breaks in classrooms during the school day; b) the school offers opportunities for all students to participate in intramural sports programs or physical activity clubs; c) whether the school offers interscholastic sports to students; d) whether the school offers opportunities for students to participate in physical activity before the school day through organized physical activities or access to facilities or equipment for physical activity; and e) whether the school, either directly or through the school district, has a joint use agreement for shared use of school or community physical activity facilities.

2.2.2 Independent variables

The independent variables I examined were analyzed at the school level and included urbanicity, socioeconomic status, and racial/ethnic composition. Percentage of minority students was calculated by dividing the total number of minority students over total enrollment for each school. The percentage of minority students was coded as a categorical variable with three tertiles: >6%, 6-20%, and >20%.

The percentage of students eligible for free and reduced-price lunch was used as a proxy for student body SES. Data on these variables was obtained from the National Center for Education Statistics (NCES) Common Core of Data, which annually collects fiscal and non-fiscal data, including demographic data, on all U.S. public schools from state education agency officials.²¹ The percentage of FRPL-eligible students was calculated by dividing the total number of students eligible for free or reduced-price lunch by total enrollment. This percentage was then coded as a categorical variable with three tertiles: >33% eligible, 33-50%, and >50%.

Twelve categories for urbanicity were condensed into three larger categories to define urbanicity: rural/town, suburban, and urban. The twelve original categories were determined by use of these categories in other studies assessing the relationship between school-level urbanicity and health practices.

These studies used a combination of NCES and Rural-Urban Commuting Areas classification schemes and condensed the twelve categories into the three used here.^{22,24}

Total enrollment and school level were also included in analyses as control variables. Total enrollment was divided into three categories: small (<300), medium (300-999), and large (\geq 1000). School level, or a variable indicating the grades taught in the school, was determined using School Health Profiles classification schemes. The School Health Profiles classified middle schools as those with a high grade of 9 or less, junior/senior high schools as those with a low grade of 8 or lower and high grade of 10 or higher, and high schools as those with a low grade of 9 or higher and a high grade of 10 or higher.

2.3 DATA ANALYSIS

I first conducted two sets of descriptive analyses. The first set examined the distribution of the sample in terms of school-level urbanicity, socioeconomic status, racial/ethnic makeup, and prevalence of all nutrition and physical activity practices of interest. The second set of descriptive analyses analyzed the percentages of schools reporting each outcome by school level, urbanicity, socioeconomic status, and racial/ethnic composition.

For each outcome, chi-squared tests were then conducted to test for significant relationships between the independent variables and outcomes. Bivariate logistic regression models were used to analyze strength of association between categorical measures of urbanicity, the tertiles of minority students, tertiles of those eligible for free and reduced price lunch, and odds of reporting each of the practices. Finally, I employed multivariable logistic regression to control for effects of potential confounding variables, specifically, school level and total enrollment.

3.0 RESULTS

3.1 SCHOOL CHARACTERISTICS

Table 1 presents descriptive statistics for the 318 schools included in this analysis. In about two-thirds of schools (n=214), enrollment was between 300 and 1,000 students, and the percentage of minority students was less than 20%. In one-third of schools (n=107), $\geq 50\%$ of students were eligible to receive free or reduced-price lunch, and the percentage of minority students was 20%. The largest proportion of schools was classified as being located in a rural or town area (n=132) followed by suburban (n=122). The smallest proportion of schools (n=64, or 20%) were classified as urban.

Table 2 shows the proportion of schools in the sample reporting each nutrition and physical activity promotion practice of interest. Among the 10 nutrition promotion practices, the most common practices consistent with local wellness policy rule guidelines were placing fruits and vegetables near the cafeteria cashier (76.4%), providing nutrition and caloric information to students and families (65.3%), and collecting suggestions from students, families, and school staff on nutritious food preferences and strategies to promote healthy eating (56.9%) (Table 2). All other strategies were reported in less than 50% of schools. The least common nutrition promotion strategies were pricing healthy foods a lower cost than less healthy foods (15.7%), planting a school food or vegetable garden (21.3%), and providing students with opportunities to visit the cafeteria to learn about food safety, food preparation, and other nutrition-related topics (27%).

Table 1. Demographic Characteristics of Pennsylvania Secondary Schools - School Health Profiles, 2014

Characteristic	% (N)
School Level	
Middle	45.9 (145)
Junior/Senior	19.2 (61)
High	34.9 (111)
Total Enrollment	
Small (<300)	13.5 (43)
Medium (300-999)	67.3 (214)
Large (≥1000)	19.2 (61)
% Eligible for Free and Reduced-Price Lunch (FRPL-Eligible)	
< 33%	33.6 (107)
33-50%	33.6 (107)
> 50%	32.7 (104)
% Minority	
< 6%	32.1 (102)
6-20%	33.6 (107)
> 20%	34.6 (110)
Urbanicity	
Suburban	38.4 (122)
Rural/Town	41.5 (132)
Urban	20.1 (64)

The sample includes 318 Pennsylvania public middle, junior/senior high, and high schools.

Table 2. Percentage of Schools with Selected School Health Practices – Pennsylvania School Health Profiles Study, 2014

Practice	%
Nutrition Promotion	
Offered self-serve salad bar	42.8
<i>Economic Strategies</i>	
Placed fruits and vegetables near the cafeteria cashier	76.4
Labeled healthful foods with appealing names	37.4
Priced nutritious foods and beverages at a lower cost	15.7
<i>Educational Strategies</i>	
Provided nutrition and caloric information	65.3
Collected suggestions on nutritious food preferences and strategies to promote healthy eating	56.9
Provided opportunities for students to visit the cafeteria	27.0
<i>Community Engagement Strategies</i>	
Conducted taste tests to determine food preferences for nutritious items	45.9
Served locally or regionally grown foods	41.5
Planted a school garden	21.3
Physical Activity Promotion	
Interscholastic sports	89.0
Intramural sports	68.2
Joint use agreement	56.9
Access to organized physical activities or facilities/equipment	33.9
Classroom physical activity breaks	29.2

The sample includes 318 Pennsylvania public middle, junior/senior high, and high schools

Table 3 shows the proportion of schools reporting each nutrition promotion practice of interest by demographic characteristic and tertile. The distribution of some nutrition promotion practices varied by racial/ethnic composition and tertiles of students eligible for free or reduced-price lunch. For example, 91.5% of schools with less than one-third of students eligible for free or reduced-price lunch reported using at least one economic practice, while 85% of schools with 33-50% of FRPL-eligible students and 86.5% of schools with over 50% FRPL-eligible students reported using at least one economic strategy. Ninety percent of schools with a low proportion of minority students reported using at least one economic strategy, compared to less than 87.7% of schools with a medium proportion of minority students and 85.4% of schools with a high proportion of minority students.

Table 3. Percentages of schools with selected nutrition promotion practices by subcategory

VARIABLE	Economic Strategies Percentage (P-value)	Educational Strategies Percentage (P-value)	Community Engagement Strategies Percentage (P-value)	Salad Bar Percentage (P-value)
School Level				
Middle (ref)	90.4	76.1	68.4	37.6
Jr/Sr High	78.6 (0.02)	67.21 (0.18)	68.8 (0.94)	39.3 (0.94)
High	89.1 (0.55)	77.4 (0.92)	79.2 (0.08)	51.3 (0.12)
% FRPL				
< 33 % (ref)	91.5	83.1	75.7	56.0
33-50%	85.0 (0.20)	71.0 (0.09)	73.8 (0.82)	43.9 (0.18)
> 50%	86.5 (0.57)	71.1 (0.33)	67.3 (0.91)	27.8 (0.01)
% Minority				
<6% (ref)	90.2	75.4	72.5	46.0
6-20%	87.7 (0.11)	81.1 (0.84)	76.4 (0.63)	50.9 (0.98)
> 20%	85.4 (0.22)	69.0 (0.49)	68.1 (0.90)	31.8 (0.64)
Urbanicity				
Suburban (ref)	89.3	77.0	76.2	48.3
Rural/Town	87.8 (0.79)	76.5 (0.62)	72.7 (0.72)	44.7 (0.88)
Urban	84.3 (0.73)	68.7 (0.94)	64.0 (0.32)	28.1 (0.79)

P-values are derived from chi-squared tests of significance and show whether the proportion of schools enacting the practice is significantly different from the reference tertile (labeled as ref). Economic Strategies include using attractive displays for fruits and vegetables, labeling healthful foods with appealing names, and pricing healthier foods lower than less healthy foods. Educational Strategies include providing nutritional and caloric information, providing opportunities for students to visit the school cafeteria, and engaging students in food and

vegetable gardening. Community Engagement Strategies include serving local food, conducting taste tests, and soliciting suggestions relating to food preferences. Schools were coded as “1” if they reported having at least one practice in place in the category of interest.

Approximately eighty percent of schools in the lowest tertile of FRPL-eligible students reported utilizing at least one educational strategy, compared to 71% of schools in the middle tertile and 71.1% of schools in the highest tertile. In contrast, utilizing at least one educational strategy was most common in schools with a medium percentage of minority students, with 81.1% of these schools reporting at least one educational strategy. Seventy-five percent of low-minority schools reported using an educational strategy, followed by 69% of high-minority schools.

Table 4 shows the proportion of schools reporting each physical activity promotion practice of interest by demographic characteristics and their associated tertiles. The most common physical activity promotion strategies were offering intramural sports (68.2%), offering interscholastic sports (89%), and instituting a joint use agreement (56.9%). The least common strategy was implementing physical activity breaks in the classroom with only 29.2% of schools reporting implementing this strategy. As with nutrition promotion strategies, there were differences by percentage of FRPL-eligible and minority students, and some of these differences were significant. Schools with over 50% of FRPL-eligible students were most likely report having classroom physical activity breaks, compared to 26% of students in the lowest FRPL tertile and 25% of students in the middle FRPL tertile. However, schools with the lowest percentage of FRPL-eligible students were most likely to offer intramural sports (almost 73.0%) compared to 64.4% of students in the middle tertile and 67.3% of schools in the highest tertile. By percentage of minority students, 18.6% of schools with less than 6% minority students offered intramural sports, compared to 69.0 % of schools in both the middle and high tertiles.

There were significant differences by student body socioeconomic status in offering interscholastic sports. Around 94% of schools in the lowest FRPL category offered interscholastic sports, compared to 93.4% in the middle category and 78.8% in the highest FRPL category. Similarly, 96.0% of schools in the lowest minority category offered interscholastic sports compared to 94.3% in the middle category and 77.2% in the minority category. Schools with a low proportion of FRPL-eligible students were more likely to make physical activity facilities or programs available before school (37.3%) compared to schools with medium (30.8%) and high proportions (33.6%). This variable was distributed similarly by percentage of minority students, with 36.2% of schools with a low proportion of minority students reporting this practice compared to 32% of schools with a medium proportion of minority students and 33.6% of schools with a high proportion.

Table 4. Percentages of schools with selected physical activity promotion practices by subcategory

Variables	Physical Activity Breaks	Intramural Sports	Interscholastic Sports	Physical Activity Facilities/ Programs Before School	Joint Use Agreements
	Percentage (P-value)	Percentage (P-value)	Percentage (P-value)	Percentage (P-value)	Percentage (P-value)
School Level					
Middle (ref)	43.8	72.6	86.3	28.08	65.0
Jr/Sr High	21.3 (0.014)	59.0 (0.100)	86.8 (0.39)	26.23 (0.73)	37.7 (0.00)
High	14.4 (0.000)	67.5 (0.341)	93.6 (0.24)	45.9 (0.01)	56.7 (0.14)
% FRPL-Eligible					
< 33% (ref)	26.1	72.9	94.3	37.3	61.6
33-50%	25.2 (0.97)	64.4 (0.331)	93.4 (0.98)	30.8 (0.26)	53.2 (0.71)
> 50%	36.5 (0.57)	67.3 (0.208)	78.8 (0.50)	33.6 (0.51)	55.7 (0.49)
% Minority					
< 6% (ref)	18.6	64.7	96.0	36.2	52.9
6-20%	28.3 (0.19)	70.7 (0.980)	94.3 (0.35)	32.0 (0.40)	60.3 (0.71)
> 20%	40.0 (0.04)	69.0 (0.770)	77.2 (0.03)	33.6 (0.59)	57.2 (0.59)
Urbanicity					
Suburban (ref)	27.0	68.8	91.8	31.9	61.4

Rural/Town	25.0 (0.23)	65.1 (0.99)	93.9 (0.58)	34.0 (0.66)	52.2 (0.48)
Urban	42.1 (0.39)	73.4 (0.17)	73.4 (0.36)	37.5 (0.25)	57.8 (0.82)

P-values are derived from chi-squared tests of significance and show whether the proportion of schools enacting the practice is significantly different from the reference tertile (labeled as ref). A joint use agreement is a formal agreement between two separate government entities—often a school and a city or county—setting forth the terms and conditions for shared use of public property or facilities.²⁵

Joint use agreements were most common among high SES schools (61.6%), compared to 53.2% of moderate SES schools and 55.7% of low-SES schools. In contrast, joint use agreements were most common in schools with a medium proportion of minority students (60.3%) followed by 57.2% among high minority schools and 52.9% in low minority schools.

3.2 BIVARIATE ANALYSIS

3.2.1 Nutrition Promotion

The initial bivariate analysis of all dependent variables yielded few statistically significant relationships (not shown). Total enrollment had little to no association with any of the nutrition outcomes in this study. In the bivariate model, the percentage of minority students and students eligible for free or reduced-price lunch was significantly negatively associated with the practice of providing information on nutritional and caloric content of school foods to students and families. In contrast, schools with a higher percentage of minority students had over two times greater odds of having a food or vegetable garden. However, there was a highly significant negative association between higher proportions of minority and low-income students and using attractive displays for fruits and vegetables, as were urban schools compared to suburban schools. High schools appeared significantly more likely to collect suggestions on nutritious food preferences and strategies to promote healthy eating compared to primary schools in the sample. No other associations were significant.

The researcher then ran a model in which these nutrition promotion variables were condensed into the categories discussed above. Responses for each category were coded as “1” if the school had at

least one of the practices in the category, and “0” if they had none of the practices in that category. Junior/senior high schools displayed significantly lower odds of using economic strategies compared to middle schools, while there were no significant differences between high schools and middle schools. Both junior/senior high schools and high schools had significantly lower odds of using educational strategies compared to middle schools. Regarding community engagement strategies, high schools had marginally significantly higher odds of using community engagement nutrition promotion strategies.

Neither the percentage of students eligible for free and reduced-price lunch nor the percentage of minority students significantly affect whether or not a school utilized a community engagement, economic, or educational strategy. Lastly, high schools and schools with over one-half of students eligible for free and reduced-price lunch displayed significantly lower odds of having a salad bar compared to middle schools and schools with one-third or less of its student eligible for free or reduced-price lunch. Schools with greater than 20% minority students and urban schools were also significantly less likely to have a salad bar compared to schools with less than 6% minority students and suburban schools. There were no significant differences relating to having a salad bar between schools with 6 to 20% minority students and schools with less than 6% minority students, or between rural/town and suburban schools.

3.2.2 Physical Activity Promotion

Similarly to the nutrition outcomes, total enrollment had essentially no impact on odds of reporting any physical activity-related outcomes in this study. In the bivariate physical activity model, junior/senior high schools and regular high schools had significantly lower odds of reporting implementation of classroom physical activity breaks in addition to recess. There were no significant differences in physical activity breaks by free or reduced-price lunch category. However, schools with over 20% minority students had nearly three times greater odds of reporting physical activity breaks. Urban schools had nearly two times greater odds of reporting physical activity breaks compared to suburban schools. There were no significant differences between rural/town schools and suburban schools.

Junior/senior high schools displayed lower odds of having joint use agreements in place compared to middle schools, but there were no significant differences between high schools and middle schools. There were no other significant predictors of whether or not a school had joint use agreements allowing community members or groups to use school facilities outside of school hours.

With regard to sports offerings, junior/senior high schools had over 50% lower odds of offering intramural sports compared to middle schools, while neither the percentage of students eligible for free or

reduced-price lunch, the percentage of minority students, or the urbanicity appeared to have any significant impact on offering intramural sports. School level had no significant impact on whether or schools offered interscholastic sports, but schools with over 50% low-income students, over 20% minority students, and urban schools showed lower odds of offering interscholastic sports. High schools had two times greater odds of providing opportunities for physical activity before the school day through access to school facilities or organized sports compared to middle schools or junior/senior high schools, while the percentage of low-income and minority students had no significant impact.

3.3 MULTIVARIABLE ANALYSIS

In multivariable logistic regression analyses, school level was statistically significantly associated with reporting at least one economic nutrition promotion strategy, with junior/senior high schools displaying lower odds of having an economic nutrition promotion strategy compared to middle schools (OR = 0.33, 95% CI = 0.14, 0.81) (Table 5). Low SES schools had significantly lower odds of having a salad bar compared to high SES schools (OR=0.34, 95% CI = 0.18, 0.82). There were no statistically significant differences in the odds of having a salad bar between high and moderate SES schools (OR = 0.65, 95% CI = 0.35, 1.20).

Junior/senior high and high schools had significantly lower odds of reporting classroom physical activity breaks compared to middle schools (OR = 0.39, 95% CI = 0.18, 0.83); OR = 0.23, 95% CI = 0.12, 0.43, respectively) and junior/senior high schools also had lower odds of having a joint use agreement compared to middle schools (OR = 0.32, 95% CI = 0.17, 0.63). High schools had over two times greater odds of providing access to physical activity before school compared to middle schools (OR = 2.97, 95% CI = 1.07, 8.18).

The percentage of students eligible for free or reduced-price lunch appeared to have no significant association with the odds of offering interscholastic sports. This independent variable also had no significant association with any other physical activity outcomes. However, schools with over 20% minority students had significantly lower odds of offering interscholastic sports (OR = 0.16, 95% CI = 0.03, 0.82). In contrast, they had nearly three times greater odds of reporting implementation of classroom physical activity breaks (OR = 2.97, 95% CI = 1.08, 8.18).

Table 5. Adjusted odds ratios for nutrition-related policies and practices by school type, percentage of low-income students, percentage of minority students, and school location

VARIABLES	Economic Strategies Odds Ratio (95% CI)	Educational Strategies Odds Ratio (95% CI)	Community Engagement Odds Ratio (95% CI)	Presence of Salad Bar Odds Ratio (95% CI)
Middle (ref)				
Jr/Sr High	0.332* (0.136 - 0.808)	0.617 (0.304 - 1.251)	1.026 (0.515 - 2.046)	1.026 (0.527 - 1.996)
High	0.777 (0.338 - 1.789)	0.968 (0.528 - 1.778)	1.708 (0.945 - 3.086)	1.522 (0.902 - 2.567)
<33% FRP (ref)				
33-50% %	0.529 (0.198 - 1.411)	0.523 (0.250 - 1.098)	1.087 (0.537 - 2.201)	0.652 (0.353 - 1.204)
>50%	0.712 (0.223 - 2.270)	0.649 (0.274 - 1.535)	0.952 (0.425 - 2.133)	0.388** (0.183 - 0.821)
<6% Minority (ref)				1.001
6-20%	0.426 (0.150 - 1.211)	1.082 (0.495 - 2.366)	1.202 (0.575 - 2.510)	1.001 (0.522 - 1.919)
>20%	0.431 (0.111 - 1.674)	0.710 (0.262 - 1.920)	1.064 (0.398 - 2.844)	0.811 (0.334 - 1.971)
Urbanicity				
Suburban (ref)				
Rural/Town	0.872 (0.317 - 2.402)	1.222 (0.559 - 2.672)	0.873 (0.418 - 1.826)	0.954 (0.498 - 1.827)
Urban	0.817 (0.263 - 2.544)	1.037 (0.438 - 2.451)	0.642 (0.269 - 1.534)	0.890 (0.378 - 2.096)

*p<0.05, **p<0.01

Table 6. Adjusted odds ratios for physical activity-related policies and practices by school type, percentage of FRPL-eligible students, percentage of minority students, and school location

VARIABLES	Physical Activity Breaks Odds Ratio (95% CI)	Intramural Sports Odds Ratio (95% CI)	Interscholastic Sports Odds Ratio (95% CI)	Access to Physical Activity Programs or Facilities Before School Odds Ratio (95% CI)	Joint Use Agreement Odds Ratio (95% CI)
Middle (ref)					
Jr/Sr High	0.394* (0.188 - 0.827)	0.571 (0.293 - 1.113)	0.652 (0.243 - 1.750)	0.879 (0.429 - 1.801)	0.328** (0.170 - 0.634)
High	0.232** (0.123 - 0.439)	0.764 (0.439 - 1.329)	1.753 (0.684 - 4.493)	2.139** (1.254 - 3.651)	0.674 (0.400 - 1.134)
<33% FRP (ref)					
33-50%	0.984 (0.471 - 2.053)	0.722 (0.374 - 1.394)	0.986 (0.277 - 3.507)	0.684 (0.356 - 1.315)	0.886 (0.475 - 1.656)
>50%	0.784 (0.340 - 1.805)	0.608 (0.280 - 1.319)	0.654 (0.191 - 2.245)	0.769 (0.352 - 1.680)	0.774 (0.369 - 1.623)
<6% Min.					
6-20%	1.679 (0.763 - 3.695)	1.009 (0.509 - 2.001)	0.502 (0.117 - 2.153)	0.747 (0.377 - 1.480)	0.886 (0.460 - 1.706)
>20%	2.966* (1.076 - 8.179)	0.873 (0.350 - 2.175)	0.161* (0.0316 - 0.817)	0.770 (0.301 - 1.967)	0.788 (0.324 - 1.914)
Suburb (ref)					
Rural/Town	1.600 (0.746 - 3.429)	1.000 (0.504 - 1.983)	0.698 (0.196 - 2.488)	1.164 (0.588 - 2.305)	0.790 (0.411 - 1.517)
Urban	1.463 (0.618 - 3.464)	1.820 (0.776 - 4.267)	0.619 (0.220 - 1.741)	1.662 (0.700 - 3.943)	1.100 (0.490 - 2.470)

*p<0.05, **p<0.01

4.0 DISCUSSION

Using state-representative survey data, this study found variation in self-reporting of various evidence-based physical activity and nutrition promotion strategies across Pennsylvania public secondary schools by demographic factors. Overall, descriptively, schools with higher percentages of low-income and minority students generally had lower odds of reporting evidence-based nutrition and physical activity promotion strategies – however, most relationships were not statistically significant. For example, schools with 33-50% FRPL-eligible students showed lower odds of using economic strategies compared to schools in the bottom tertile of FRPL-eligible students (OR=0.529), the difference was not statistically significant (p=0.20). Similarly, while schools with over 50% FRPL-eligible students showed lower odds of offering interscholastic sports compared to schools in the reference tertile (OR=0.654), this difference was also not statistically significant (p=0.50). The effect of urbanicity was more mixed, with rural and/or urban schools sometimes displaying lower odds of reporting nutrition and physical activity promotion practices and sometimes displaying higher odds, depending on the practice. For example, rural schools showed higher odds of using educational nutrition promotion strategies compared to suburban schools (OR=1.222, p=0.62), but lower odds of offering interscholastic sports (OR=0.698, p=0.58), and neither relationship was statistically significant. In fact, one of the relationships between urbanicity and any of the practices were statistically significant.

It is striking that most of the practices studied were being implemented in less than half of schools. Less than 50% of schools in the sample reported having a salad bar, pricing healthy foods at a lower cost compared to unhealthy foods, labeling healthy foods with appealing names, providing opportunities for students to visit the cafeteria, conducting taste tests, serving locally or regionally grown foods, planting a school garden, or instituting classroom physical activity breaks. It is important to note that some of these strategies, such as labeling healthy foods with appealing names, providing opportunities to visit the cafeteria, conducting taste tests, and instituting physical activity breaks, cost little to no money, yet are rare in Pennsylvania schools. These findings show that cost may not be the only barrier to implementing evidence-based obesity prevention practices in Pennsylvania schools. Ultimately, despite upcoming federal rules requiring goals in these areas, many schools are not implementing

nutrition and physical activity promotion practices that would meet local wellness policy requirements for these content areas.

At least 60% of schools reported placing fruits and vegetables near the cashier, using attractive displays for fruits and vegetables, providing nutritional information to students or families, providing intramural sports, and providing interscholastic sports. This shows that a significant percentage of Pennsylvania public secondary schools are implementing these practices, and policymakers should consider how to disseminate these practices among more schools.

Similarly to other studies, this research yielded no consistent pattern regarding the association between school-level demographic factors and obesity prevention practices in schools.^{7-12,15,16,18,19} School level appeared to be the most consistent predictor of whether or not schools had certain policies or practices in place. Junior/senior high schools had significantly lower odds of using economic nutrition promotion strategies, but there were no significant differences in odds of using any of the strategies studied between high schools and middle schools. In contrast to other studies, urbanicity had no statistically significant impact on any of the outcomes studied.^{7-12,15,16,18,19}

Schools where over half of the student population was eligible for free or reduced-price lunch showed significantly lower odds of having a salad bar. This could be due to the fact that buying, installing, and maintaining a salad bar requires significant resources that may not be present in lower-income schools. While research shows that salad bars can increase the amount and variety of fruits and vegetables consumed by students, many schools cannot afford even the basic equipment to install a salad bar.²³ The only other significant relationship found among the nutrition practice outcomes was that schools with over 50% of students eligible for free or reduced-price lunch had significantly lower odds of having a salad bar compared to schools with less than 33% of students eligible for free or reduced-price lunch. Let's Move Salad Bars to Schools (LMSB2S) is a national program launched in 2010 by Michelle Obama's *Let's Move!* initiative with the aim of increasing children's fruit and vegetable intake by placing 6000 salad bars in schools over three years.²⁴ Any school that participates in the National School Lunch Program is eligible to apply for a grant. The program prioritizes schools based on the percent of students eligible for free or reduced-price lunch and commitment to support a salad bar every day during school lunch. As of 2014, LMSB2S has donated equipment to over 2,800 schools across the country, including many school districts in Pennsylvania. However, less than half of Pennsylvania secondary schools offer salad bars (42.8%), and schools with the greatest proportion of low-income students are least likely to offer salad bars. This is problematic because low-income adolescents are also more likely to be obese, and thus could stand to benefit the most from a salad bar intervention. It seems that LMSB2S is a program that could significantly benefit Pennsylvania schools, and it might be beneficial to explore how many Pennsylvania public secondary schools are taking advantage of the program.

Schools where more than 20% of students were minorities displayed lower odds of offering interscholastic sports but nearly three times greater odds of implementing classroom physical activity breaks. One possible explanation for this is that while interscholastic sports require substantial resources that schools with a high percentage of low-income students may not possess, classroom physical activity breaks do not require any resources except for a minimal amount of time. While this explanation does not directly explain the correlations with percentage of minority students, schools with a high percentage of minority students are also more likely to have a higher percentage of minority students because minority children are more likely to attend high-poverty schools.²³

Junior/senior high and high schools had significantly lower odds of reporting instituting physical activity breaks compared to middle schools, and junior/senior high schools also had significantly lower odds of having a joint use agreement. However, high schools had over two times greater odds of providing students with access to physical activity facilities or organized programs before school. This last finding may be due to the fact that high schools are more likely to have interscholastic sports teams compared to schools with younger grades, and this question could be capturing the tendency of some of these sports teams to practice before school. Since the School Health Profiles question only refers to “students” and does not specify “all students” we do not know if the schools responding affirmatively provide access to these programs and facilities to all students before school, or only student athletes.

5.0 LIMITATIONS

The main limitation of the present study was the relatively small sample size, which may have led to Type II error and thus the lack of significant findings between many of the independent and dependent variables. For example, the odds of a rural or town school reporting having interscholastic sports was 0.69 times that of a suburban school, and the odds for urban schools was 0.61 times that of suburban schools (see Table 3). However, these differences were not statistically significant.

Another limitation was the use of self-report data. While the School Health Profiles data is intended to document the health practices implemented in schools, some school principals may be motivated to overreport the presence of certain policies or practices. Thus, these data may overstate the percentage of Pennsylvania secondary schools with certain evidence-based nutrition and physical activity promotion strategies.

Lastly, because this was a cross-sectional study, we cannot make any inferences regarding causal relationships between the independent and dependent variables studied.

Strengths include the use of state-representative data and examination of a variety of nutrition and physical activity promotion practices. To the author's knowledge, few other studies have examined such a wide range of nutrition and physical activity promotion practices in schools by demographic factors. Additionally, no other published study has utilized the most recent School Health Profiles data for Pennsylvania to examine the distribution of any health-related policies or practices.

6.0 CONCLUSIONS

The aim of this study was to assess the prevalence of evidence-based obesity prevention practices in Pennsylvania public secondary schools, and whether or not disparities existed by school-level demographic factors. This study shows that many evidence-based obesity prevention practices are not being widely implemented in Pennsylvania public middle and high schools, and that differences in the prevalence of evidence-based obesity prevention practices do appear to exist among schools with varying demographic characteristics, with practices generally less common among schools with higher proportions of low-income and minority students. As some of the least common practices were also some of the least resource-intensive, such as classroom physical activity breaks, it appears that barriers in addition to cost may exist, such as lack of will among school administration and staff to implement these practices, low parental and student involvement, or knowledge of evidence-based practices among school administration and staff. More research may also be needed to determine the impact of economic conditions of the surrounding neighborhood on school practices.

7.0 IMPLICATIONS FOR SCHOOL HEALTH

These findings reveal important information regarding what percentage of Pennsylvania secondary public schools report implementing evidence-based nutrition and physical activity policies that meet upcoming local wellness policy requirements. This research reveals that less than half of these schools are implementing a variety of practices that have the potential to increase students' daily physical activity and meet federal requirements for nutrition and physical activity promotion goals. Additionally, some of the least prevalent practices are the cheapest and simplest to implement of the outcomes studied, such as labeling healthy foods with appealing names and implementing physical activity breaks in the classroom. Some of these practices are least common among the schools who arguably would benefit the most from them – schools with high proportions of low-income and minority students.

While the Child Nutrition Reauthorization Act of 2004 required local education agencies to engage a variety of stakeholders in development of local wellness policies, including parents and students, the Healthy, Hunger-Free Kids Act adds requirements for participation of physical education teachers and school health professionals in development, implementation and periodic review, and updating of local wellness policies (USDA 2013). Increased participation by school health professionals will allow individuals knowledgeable about health and physical activity to have greater input in establishment of health-promoting practices. Local wellness policy committees should examine the proposed wellness policy requirements and assess what practice options that will meet requirements are realistic to implement in their school or district. These committees should prioritize practices that require no or little money to implement but are supported by strong scientific evidence demonstrating their ability to increase student physical activity and consumption of nutritious foods, such as Smarter Lunchroom behavioral economic strategies and classroom physical activity breaks. Schools should also consider how they may be able to partner with nonprofit organizations and initiatives such as the Farm to School Network and Let's Move Salad Bars to Schools to implement more resource-intensive practices like school gardens and serving local foods in the cafeteria. As public health experts, school health professionals and physical education teachers can play a lead role in identifying and recommending best practices for implementing health promoting activities.

Education and public health agencies and policymakers at state and local levels can help increase the capacity of schools to meet local wellness policy requirements in several ways. First, they should educate schools about local wellness policy requirements and what obesity prevention practices will meet upcoming regulations. Agencies can collaborate with local wellness policy committees and child obesity-related organizations to help schools identify what practices are most feasible to implement given resource and time constraints. These collaborations should engage students by consulting them on what practices, such as taste tests or school gardens, they would most like to see implemented in their schools. Engaging students in this manner gives them a say in policy implementation and increases the chance that they will adopt healthier behaviors as a result of the chosen interventions.

As this study shows that schools with proportions of minority and low-income students appear to be less likely to report implement evidence-based practices, education and health governmental agencies should prioritize these schools when providing consultation and technical assistance. They should work closely with these schools, including all members of local wellness policy committees, to determine barriers to implementation of evidence-based practices and what practices are most feasible and attractive for stakeholders. Working closely with these schools and understanding economic, time, and cultural barriers to implementation of evidence-based strategies will better enable these schools to institute effective and feasible obesity prevention practices.

7.1 PUBLIC HEALTH RELEVANCE

Child overweight and obesity is a highly prevalent public health problem that affects nearly 20% of U.S. children. Additionally, child obesity is linked to greater risk of adult obesity, as well as a variety of severe chronic health conditions, including type 2 diabetes, heart disease, stroke, and cancer. Obesity is also associated with psychological health problems, including depression and low self-esteem.

As children spend on average of over 6 hours a day in school, schools provide a natural and convenient setting for obesity interventions.²⁶ Evidence-based obesity prevention practices in schools, such as those discussed above, hold promise for increasing healthy nutrition and physical activity-related behaviors among students and thus reducing risk for obesity and chronic disease. This research provides baseline information to education and health policymakers in Pennsylvania regarding the prevalence of evidence-based practices in public secondary schools that meet upcoming federal regulations, and whether disparities exist by demographic factors. This paper also provides recommendations for helping schools implement best practices and reducing disparities. If utilized, this information can help

policymakers and schools disseminate evidence-based practices, promote healthy behavior, and ultimately reduce child obesity and associated disparities.

APPENDIX A: ADDITIONAL TABLES

Table 7. Comparison 2004 CNRA and 2014 HHFKA local wellness policy requirements

Child Nutrition Reauthorization Act Requirements, 2004	Healthy Hunger-Free Kids Act Proposed Rule Requirements, 2014
All local education agencies (LEAs) must have an LWP for each school in its jurisdiction	Adds requirements related to public participation, transparency, and implementation
LWPs must include, at minimum, goals for: <ul style="list-style-type: none"> ➤ Nutrition education, ➤ Physical activity, ➤ Other school-based activities to promote wellness ➤ Nutrition guidelines for all foods available on school campus. 	LWPs must also include goals for nutrition promotion
Parents, students, and representatives of the school food authority, the school board, school administrators, and the public must be involved in the development of LWP.	Physical education teachers and school health professionals must also be able to participate in LWP development
The stakeholders named above are required to participate in the development of the LWP	All stakeholders named in 2004 law, as well as physical education teachers and school health professionals, must also be able to participate in LWP development, implementation, periodic review, and update
LEAs can choose the specific policies appropriate for schools under their jurisdiction as long as those policies include all required elements specified in the CNRA	No change
No requirements for public notification	LEAs must inform and update the public, including

Table 4 Continued	parents, students, and others in the community, about the content and implementation of the LWP.
LEAs must establish a plan for measuring LWP implementation	<p>LEAs must periodically measure and make available to public an assessment of LWP implementation, including:</p> <ul style="list-style-type: none"> ➤ Extent to which schools are in compliance with the LWP, ➤ Extent to which the LWP compares to a model LWP ➤ Description of progress made in meeting LWP goals
LEAs must establish plan for measuring LWP implementation, including delegating one or more individuals with responsibility for ensuring LWP compliance	LEAs are required to designate one or more LEA officials or school officials to ensure that each school complies with the LWP.

Table 8. Comparison of federal nutrition and physical activity-related local wellness policy requirements and related School Health Profiles questions

	Proposed 2014 Nutrition- and Physical Activity-Related Local Wellness Policy Requirements	School Health Profiles Outcome
Nutrition Promotion	<ul style="list-style-type: none"> • Local education agencies (LEAs) required to review and consider evidence-based strategies and techniques in establishing goals for nutrition promotion and education, physical activity, and other school based activities that promote student wellness. • At minimum, LEAs expected to review “Smarter Lunchroom” tools and strategies, which are evidence-based, simple, low-cost and no-cost changes shown to improve student participation in the National School Lunch and School Breakfast Program while encouraging consumption of more whole grains, fruits, vegetables, and legumes, and decreasing plate waste". For example: <ul style="list-style-type: none"> ➤ Using creative names for fruits and vegetables ➤ Training staff to prompt students to select fruits and vegetables ➤ Placing unflavored milk in front of other beverage choices ➤ Bundling "grab and go" meals that include fruit and vegetable items 	<p>35. During this school year, has your school done any of the following? (Mark Yes/No for each)</p> <p>a. Priced nutritious foods and beverages at a lower cost while increasing the price of less nutritious foods and beverages</p> <p>b. Collected suggestions from students, families, and school staff on nutritious food preferences and strategies to promote healthy eating</p> <p>h. Placed fruits and vegetables near the cafeteria cashier, where they are easy to access</p> <p>i. Used attractive displays for fruits and vegetables in the cafeteria</p> <p>j. Offered a self-serve salad bar to students</p> <p>k. Labeled healthful foods with appealing names (e.g., crunchy carrots)</p>
	<ul style="list-style-type: none"> • Local school wellness policy goals related to nutrition promotion and education might include activities such as: 	<p>35. During this school year, has your school done any of the following? (Mark Yes/No for each)</p> <p>c. Provided information on the nutrition</p>

<p>Table 8 Continued</p>	<ul style="list-style-type: none"> ➤ Providing developmentally appropriate and culturally relevant participatory activities, such as contests, demonstrations and taste testing, voting for school meal recipe names, farm visits, school gardens..." ➤ Offering information to families that encourages them to teach their children about health and nutrition 	<p>and caloric content to students and families on the foods available</p> <p>d. Conducted taste tests to determine food preferences for nutritious items</p> <p>e. Provided opportunities for students to visit the cafeteria to learn about food safety, food preparation, or other nutrition- related topics</p> <p>g. Planted a school food or vegetable garden</p>
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APPENDIX B: FIGURES

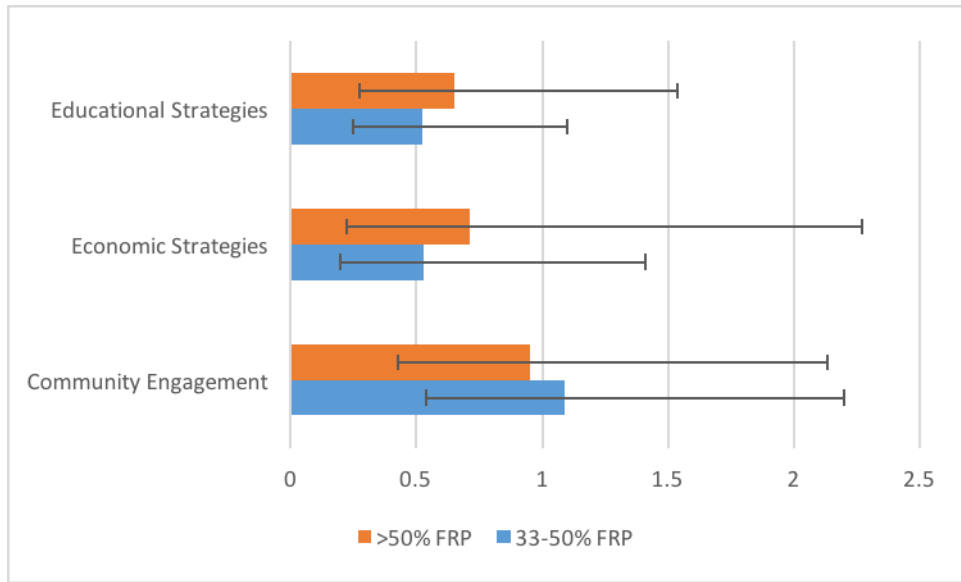


Figure 1. Adjusted odds ratios for nutrition promotion practices by percentage of low-income students

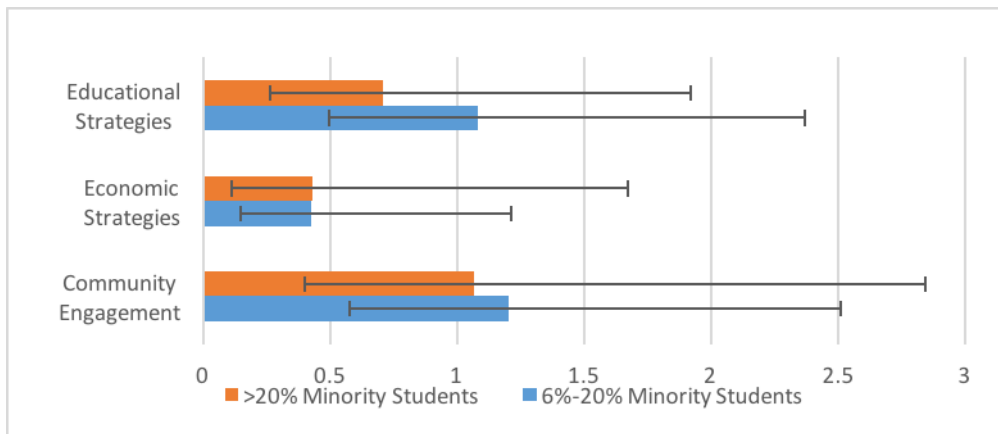


Figure 2. Adjusted odds ratios for nutrition promotion practices by percentage of minority students

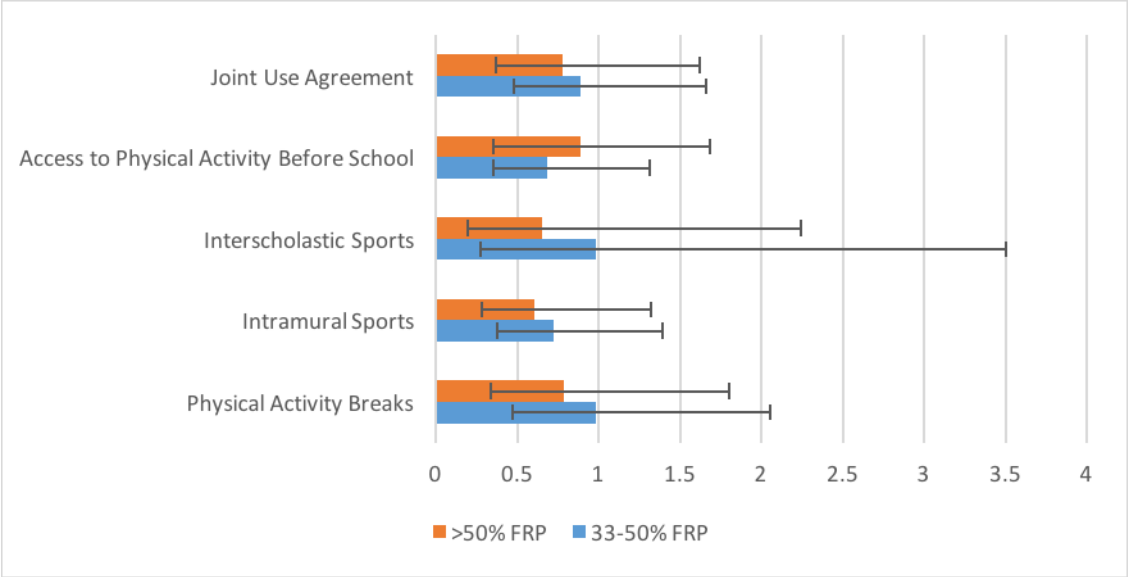


Figure 3. Adjusted odds ratios for physical activity promotion practices by percentage of low-income students

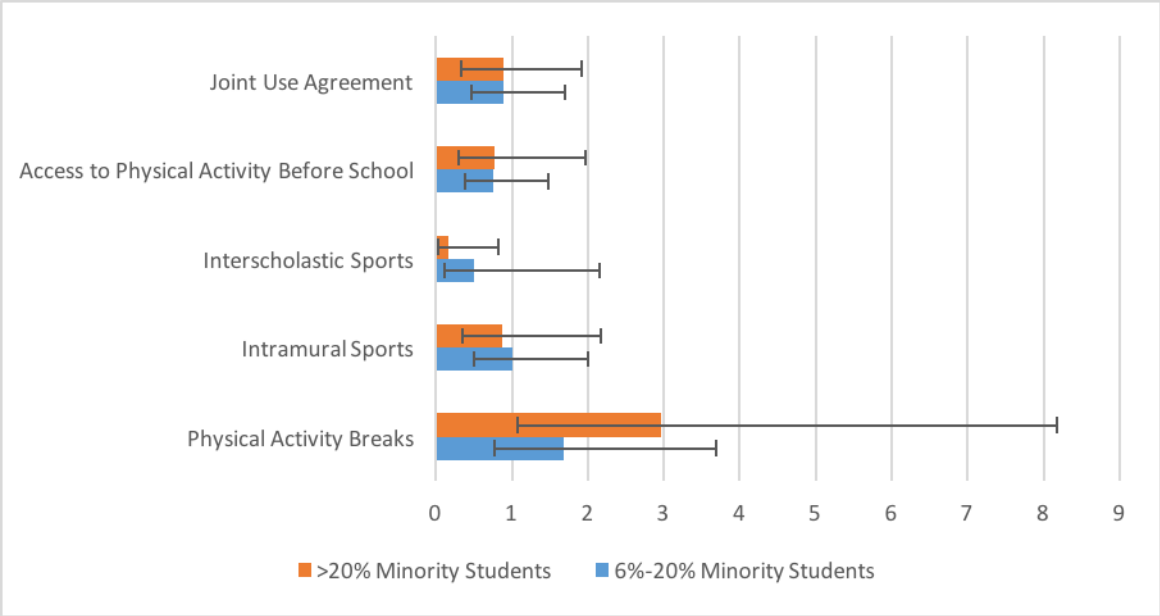


Figure 4. Adjusted odds for physical activity promotion practices by percentage of minority students

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