

RESEARCH ARTICLE

# The Relationship between Written District Policies and School Practices among High-Need Districts in New York State

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## ABSTRACT

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**BACKGROUND:** This study tested the hypothesis that written district wellness policies are associated with higher rates of implementation of nutrition and physical activity practices.

**METHODS:** Written wellness policies and building level practices were assessed for schools (N = 295) within high-need districts (N = 70) in New York State. The relationship between policies and practices was measured using multi-level mixed-effects logistic regressions.

**RESULTS:** Overall, stronger written district policies significantly increase the likelihood of practice implementation in schools. This relationship is strongest for physical education and physical activity items, followed by nutrition standards for competitive foods in middle and high schools. Most elementary schools implemented nutrition practices with or without a policy and there were differences in implementation rates between elementary and middle/high schools. When examined separately, policies were for the most part not significantly associated with implementation of corresponding practices.

**CONCLUSIONS:** Strong and comprehensive written policies are associated with higher rates of practice implementation overall, but the consistency of this relationship varies by policy-practice domain. The newer policy topics areas of school wellness promotion and marketing were less frequently included in written policies. Future research should examine whether districts that strengthen their written policies achieve greater implementation over time.

**Keywords:** child and adolescent health; healthy policy, nutrition, and diet; policy; public health; school food service.

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Over the past 15 years, schools in the United States (US) have expanded their role in efforts to improve children's nutrition, physical activity levels, and overall physical health. In 2004, the Child Nutrition and WIC Reauthorization Act required all districts participating in the federal meal programs to create a written wellness policy to guide efforts to improve nutrition education, food available at school, and physical activity.<sup>1</sup> The 2010 Healthy Hunger Free Kids Act provided further guidance on the key elements to be included in district

wellness policies.<sup>2</sup> Some of the new components included: prohibiting marketing of snack foods out of compliance with national nutrition standards; reporting to the community about policy content and implementation; and completing triennial assessments of policy compliance.

A national study of written school wellness policies from 2014 to 2015 documented that 97% of districts complied with the requirement to have a policy.<sup>2</sup> Further, the majority of district written policies included: goals for nutrition education and

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physical activity; requirements for meeting federal meal standards; and requirements for providing free drinking water at meals. On the other hand, many best practices were absent. For example, only 36% of district policies specifically referenced that all competitive foods and beverages must meet Smart Snacks standards; 14% prohibited the marketing of unhealthy foods and beverages; 33% addressed daily recess in elementary schools; and 18% addressed active routes to school.<sup>2</sup>

A key research question is whether having a comprehensive and strong written policy at the district level increases the likelihood that wellness practices are implemented in schools. The findings to date are mixed. Some studies have found significant relationships between written district wellness policies and practices that occur at the school level,<sup>3,4</sup> and others have found that having a written policy does not increase the likelihood of the relevant school practice.<sup>5,6</sup> One challenge faced in the current literature is that the written policy and implementation assessment tools are not always synchronized to match the policy with the practice. Therefore, data that facilitates clear comparisons between policy and practice are needed.

The Creating Healthy Schools and Communities (CHSC) program in New York state provides an opportunity to examine the strength of written district policies, practice implementation, and the relationship between the two. CHSC is a multi-sector initiative designed to increase demand for and access to healthy, affordable foods and opportunities for daily physical activity in high-need school districts and their associated communities.<sup>7</sup> As part of the initiative, CHSC grantees work with district-level personnel to assess the strength and comprehensiveness of their wellness policies, and with individual school building personnel to assess the degree to which district policies are implemented in each building. These assessments are used to develop action plans to strengthen and update school wellness policies and improve practice implementation.

The aim of the current study was to examine the strength of written district policies across CHSC districts; prevalence of school building-level practice implementation; and the relationship between the two in the domains of nutrition, physical activity, and wellness promotion. The hypothesis was that schools in districts with stronger written policies in each domain would have higher rates of implementation of the corresponding practices than those with weaker or absent written policies.

## METHODS

### Participants

Three stakeholder groups participated in this study: CHSC grantees; school district personnel; and school

building teachers, staff, and students. CHSC grantees and the New York State Department of Health (NYS DOH) were responsible for completing school district level policy assessments and coordinating school building assessments used for this study. CHSC grantees were selected by competitive bid by the NYS DOH and included local health departments, rural health networks, Board of Cooperative Extension Services, Cornell Cooperative Extension, community organizations, and academic institutions. School district personnel from upstate New York districts partnered with CHSC grantees to assess the strength and comprehensiveness of their district wellness policies. The districts were identified as high need based on a community needs index that placed them below the statewide median in indicators of poverty, educational attainment, and childhood obesity. Teachers, staff and parents at schools within the target districts partnered with CHSC grantees to assess the degree to which the practices that corresponded to key district wellness policies were being implemented in school buildings.

### Procedures

**District wellness policy assessment.** Assessment of district wellness policies was conducted between February 2015 and September 2017. All policies were scored using the WellSAT (version 2.0), an online quantitative assessment measure that reflects best practices and requirements from the Healthy Hunger Free Kids Act in 2015.<sup>8,9</sup> The WellSAT contains 78 items across six domains: Nutrition Education; USDA Child Nutrition Programs and School Meals; Nutrition Standards for Competitive and Other Foods and Beverages; Physical Education and Physical Activity; Wellness Promotion and Marketing; and Implementation, Evaluation and Communication. Each item was scored as a 0, 1, or 2: “0” indicates that there is no mention of the item in the policy; “1” indicates that the item is referenced with weak or vague language; and “2” indicates that there is a strong and specific policy addressing the item. This measure has established reliability for use in public health practice,<sup>5</sup> and previous research has demonstrated that grantees can complete these assessments without bias.<sup>10</sup> Grantees attended a training webinar and followed instructions posted on the WellSAT website. The data were entered into WellSAT’s online portal with a district identification number in the “policy name” field. Results were downloaded by NYS DOH and the research team.

**School practice implementation assessment.** Grantees worked with teachers, staff, and parents at each school to complete the CHSC School Building Assessment between March 2016 and July 2018. This measure includes school building name, school building identification number, and 23 items designed

to match policies assessed in the WellSAT. An example of a nutrition item in the school building assessment is “Do all beverages sold to students during the school day meet USDA minimum nutrition standards?” An example of a physical activity question is “Are regular physical activity breaks provided for all students?” For each question there were three possible responses: “Yes” indicates that the best practice described by the item is fully implemented with no room for improvement; “No” indicates that the practice is either not in place, or only partially in place with room for improvement; and “Not Applicable” was used when the question does not apply to the school building. Grantees attended a training webinar on the implementation assessments and used SurveyMonkey to submit results to NYS DOH.

Implementation data were collected on a subset of buildings in each district using convenience sampling. The sample included 313 buildings within the 79 districts, which represented 60.3% of all buildings in these districts. Districts that did not have any building implementation scores (N = 9) were removed from the sample, as were buildings that had incomplete data (N = 14). The final analysis sample included 295 schools within 70 districts.

### Data Analysis

School characteristics including school grade level, school geographic location type, percent of students eligible for free or reduced-priced school meals, and percent of students by racial and ethnic categories and total school enrollment for the CHSC-participating schools and all New York state schools were collected from the National Center for Education Statistics public school database.<sup>11</sup> One-way frequencies of CHSC and New York state school characteristics were computed to compare the sample of schools to the state overall.

One-way frequencies were used to describe the prevalence of WellSAT policy item scores across districts, and to describe the prevalence of school-level practice implementation across the CHSC implementation items. Pearson chi-square tests for independence were used to determine if there were differences in the percentage of schools implementing practices by grade level.

To account for nesting of schools within districts, multi-level mixed-effects logistic regression was used to evaluate the association between district-level wellness policy scores and school-level implementation status of corresponding practices. A total of 27 models were constructed. In the first overall model, all policy-practice combinations were pooled into a single model. In three additional overall models, policy-practice combinations within each of the three subsections of the New York CHSC implementation tool were pooled. These sub-sections included: Nutrition Standards for

Competitive Foods, Physical Education and Physical Activity practices, and Wellness Promotion and Marketing practices. WellSAT policy and CHSC practice implementation combinations were also assessed individually; there were a total 22 models to assess these distinct policy-practice combinations.

A binary variable representing the implementation status of the CHSC item (“0” for not implemented, “1” for implemented) was the dependent variable in these models. The key explanatory variable of interest was the presence of the matched WellSAT policy (“0” for no policy, “1” for weak policy, and “2” for strong policy). Models were stratified by school grade level (two levels, elementary vs. middle/high school), and adjusted for the percent of White students enrolled per school, the percent of Hispanic students enrolled per school, total school enrollment, and percent of students eligible for free or reduced-priced school meals. A Bonferroni correction was applied to account for inflation of Type I error rate due to multiple comparisons. All data analyses were completed in Stata/SE 15.1.<sup>12</sup>

## RESULTS

### Description of Sampled Schools and Comparison to New York State Schools

Demographic characteristics of schools included in the analysis sample and all New York state schools are reported in Table 1. CHSC schools included in the analysis sample were similar to New York State schools with respect to geographic location, student race and ethnicity, and average school enrollment. However, schools in the CHSC sample were significantly more likely to be elementary schools (52.2% vs 39.4% in New York state;  $\chi^2 = 18.98$ ;  $p < .0001$ ). Consistent with the high-poverty selection criteria used to for the CHSC program, the mean percent of students per school eligible for free or reduced-priced school meals was significantly higher in the sample schools compared to New York state schools (difference in mean:  $-39.9$ ;  $t = -25.90$ ;  $p < .0001$ ; adjusted for unequal variance in means between CHCS and New York state schools).

### Percent of CHSC Districts with No, Weak, and Strong Policies by Policy Topic

Table 2 reports the percent of CHSC districts with strong, weak, or no policy language on each policy item using the WellSAT 2.0. Most of the Nutrition Standards for Competitive Foods topics were addressed with either weak or strong language by more than 75% of CHSC districts. It is notable that even though the federal law dictates that all foods and beverages sold during school are Smart Snacks compliant, just over a third of districts have strong written district

**Table 1. Demographic Characteristics of Schools Participating in the New York Creating Healthy Schools and Communities (CHSC) Building Assessment and All Schools in New York State**

	CHSC sample (N = 295 schools in 70 districts)	New York schools (N = 5371)
	% (N)	% (N)
Grade level*		
Elementary schools	52.2 (154)	39.4 (1889)
Middle schools	50.9 (150)	42.2 (2024)
High schools	22.0 (65)	30.4 (1458)
Geographic location		
Urban	30.2 (89)	43.6 (2090)
Suburban	29.2 (86)	31.7 (1520)
Small Town	18.4 (55)	7.4 (356)
Rural	22.4 (66)	16.0 (769)
No data	1.0 (3)	1.3 (60)
Eligible for free/reduced meal eligibility		
<50%	10.9 (32)	69.1 (3314)
50- <70%	42.7 (126)	10.9 (521)
≥70%	46.1 (136)	16.6 (798)
No data	0.3 (1)	3.4 (162)
Race/ethnicity		
White students		
<25%	31.8 (95)	39.8 (1906)
25-50%	16.7 (50)	9.7 (466)
>50%	51.5 (154)	49.2 (2361)
No data	0.3 (1)	0.0 (0)
Black students		
<25%	66.0 (194)	70.7 (3392)
25-50%	24.1 (71)	14.5 (693)
>50%	9.5 (28)	13.5 (645)
No data	0.7 (2)	0.0 (0)
Asian students		
<5%	76.6 (226)	67.7 (3247)
5-10%	15.3 (45)	13.7 (657)
>10%	7.8 (23)	17.3 (829)
No data	0.3 (1)	0.0 (0)
Other/multiple race students		
<5%	63.7 (188)	83.4 (3997)
5-10%	27.8 (82)	12.3 (591)
>30%	8.1 (24)	3.0 (145)
No data	0.3 (1)	0.0 (0)
Hispanic/Latino students		
<25%	72.5 (214)	63.5 (3046)
25-50%	12.2 (36)	16.1 (772)
>50%	14.9 (44)	19.1 (915)
No data	0.3 (1)	0.0 (0)
Average total enrollment (standard error)	515 (22.1)	569 (6.03)

\*Some school buildings contained multiple grade levels so percent of schools by grade level does not add to 100%.

policies reinforcing this rule. The items least likely to have written policies concerned ensuring that foods and beverages sold after school were Smart Snacks compliant.

There was substantial variability in the percent of districts with no, weak, or strong policies across the Physical Education and Physical Activity items. The topics most likely to be addressed in the written

policies were having a PE curriculum and before or after school PA opportunities. On the other hand, the least common issues addressed in policies were active transportation (such as walking or biking) to school, recess for elementary schools, a comprehensive PA plan, and PA training for teachers.

Most of the Wellness Promotion and Marketing policy items were addressed by fewer than half of the districts. The most common policy to be addressed in this section was promoting physical activity to students, followed by providing family wellness activities related to nutrition and physical activity. Fewer than 40% of districts had either a strong or weak policy regulating Non-Smart Snacks marketing: on sports signage/equipment; where foods are available or sold in school; in educational materials; in fundraisers/corporate sponsorships; and through school media.

### Percent of CHSC Schools Implementing Practices at the School Building Level

Table 3 reports the percentage of elementary and middle/high schools implementing each of the practices, and a comparison of implementation by grade level using a Pearson chi-square test for independence. Elementary schools were significantly more likely than middle schools to have ensured that beverages and foods sold from vending machines, school stores, and concession stands complied with Smart Snacks, and to have implemented restrictions on foods sold for school fundraisers. In contrast, middle schools were significantly more likely than elementary schools to have implemented food restrictions on celebrations.

There was substantial variability in the percent of schools implementing the different Physical Education and Physical Activity practices. While over 80% of elementary, middle, and high schools reported implementing formal written physical education curricula, and nearly 68% of elementary schools reported offering recess to students on a daily basis, far fewer schools were implementing other physical activity and education practices. For example, fewer than 10% of schools provided staff with physical activity opportunities and fewer than 15% had a comprehensive school physical activity plan (CSPAP). Although elementary schools were significantly more likely than middle/high schools to offer regular physical activity breaks for students, the proportion of elementary schools reporting this practice was still under 40%.

There were also differences in the percentage of schools implementing School Wellness Promotion and Marketing practices. Approximately half of both elementary and middle/high schools were implementing specific strategies to promote physical activity outside physical education classes. By comparison, only

**Table 2. Percentage of School Districts in the New York Creating Healthy Schools and Communities Sample with No, Weak, or Strong Policies on Nutrition Standards for Competitive Foods, Physical Education (PE) and Physical Activity, and School Wellness Promotion Sections of the WellSAT 2.0**

WellSAT 2.0 policy item	N and % of school districts with					
	No policy		Weak policy		Strong policy	
Nutrition Standards for Competitive Foods	11	15.7%	31	44.3%	28	40.0%
Foods sold DURING school are Smart Snacks	28	40.0%	36	51.4%	6	8.6%
Foods sold AFTER school are Smart Snacks	19	27.1%	26	37.1%	25	35.7%
Beverage sold DURING school are Smart Snacks	36	51.4%	28	40.0%	6	8.6%
Beverage sold AFTER school are Smart Snacks	17	24.3%	50	71.4%	3	4.3%
Regulation of foods served during celebrations (elementary only)	19	27.1%	26	37.1%	25	35.7%
Regulation of foods sold for fundraisers	11	15.7%	31	44.3%	28	40.0%
Physical Education (PE) and Physical Activity (PA)						
Written PE curriculum K-12	26	37.1%	17	24.3%	27	38.6%
Comprehensive PA plan	50	71.4%	18	25.7%	2	2.9%
Active transport	49	75.4%	10	15.4%	6	9.2%
Before/after school PA	24	34.3%	25	35.7%	21	30.0%
Recess for elementary students	53	76.8%	14	20.3%	2	2.9%
Physical Activity breaks	22	31.4%	42	60.0%	6	8.6%
Staff involvement in PA opportunities	35	50.0%	29	41.4%	6	8.6%
Family/community engagement in PA opportunities	32	45.7%	32	45.7%	6	8.6%
PA training for all teachers	54	77.1%	11	15.7%	5	7.1%
School Wellness Promotion and Marketing						
Specific ways to promote PA	33	47.1%	26	37.1%	11	15.7%
Family wellness activities include nutrition/PA	39	57.4%	22	32.4%	7	10.3%
No Non-Smart Snacks marketed:						
On sports signage/equipment	42	60.9%	18	26.1%	9	13.0%
In educational material	46	65.7%	21	30.0%	3	4.3%
Where foods are available/sold	43	62.3%	17	24.6%	9	13.0%
On school media outlets	49	72.1%	13	19.1%	6	8.8%
In fundraisers/corporate sponsorship	50	71.4%	14	20.0%	6	8.6%

around a quarter of schools reported having family wellness activities related to nutrition or physical activity. Encouragingly, the majority of schools restricted marketing of non-Smart Snack foods and beverages on sports signage/equipment; where foods were sold or available in school; in educational materials; or through school media. However, closer to a third of schools restricted marketing of non-Smart Snack foods in fundraisers and activities with corporate sponsorship. Compared to elementary schools, middle/high schools were less likely to restrict marketing on non-Smart Snack foods and beverages through sports signage/equipment and through school media outlets. Middle/high schools were more likely than elementary schools to implement Smart Snack standards for fundraisers and corporate sponsorship.

#### **Association between District-Level Policy Scores and Implementation Status in CHSC Schools**

To compare the relationships between the existence and strength of district-level policies and the likelihood of practice implementation, an overall regression model was tested that includes pooled values across all 22 policy-practice combinations adjusted for school enrollment, percent of students who were White, Hispanic, and eligible for free or reduced school

meals. Schools in districts with strong policies were significantly more likely to implement practices overall compared to schools in districts with weak policies (odds ratio: 1.89, 95% Confidence Interval (CI): 1.60, 2.23,  $p < .0001$ ). Average likelihood of implementing a practice was also lower among schools in districts with no policy compared to schools in districts with weak policies (odds ratio: 2.19, 95% CI: 1.93, 2.48,  $p < .0001$ ). These findings support the hypothesis that there is a significant positive association between district wellness policy strength and the prevalence of practice implementation in CHSC schools.

The results from the pooled regression models for each of the three subsections (including Nutrition Standards for Competitive Foods, Physical Education and Physical Activity, and Wellness Promotion and Marketing) also indicated a positive and statistically significant association between written policy strength and implementation status. When considering all of the Nutrition items together, the average likelihood of implementing these practices was higher among schools in districts with strong policy language compared to schools in districts weak policies (odds ratio: 1.60, 95% CI: 1.15, 2.23,  $p = .005$ ). However, there was no difference in the average likelihood of implementing nutrition practices when comparing

**Table 3. Percentage of Schools Implementing New York State Creating Healthy Schools and Communities Practice Items by Grade Level**

CHSC Practice Item	% (N) Implementing			Pearson Chi-Square Test for Independence	
	Elementary	Middle/High	% (N) n/a	$\chi^2$	p-value
	(N = 154)	(N = 192)			
Nutrition Standards for Competitive Foods					
Vending machines/stores/concession comply with Smart Snacks	87.7(135)	61.4(86)	0.3(1)	27.0	<.001
Food served during celebrations have some restrictions	36.4(56)	53.9(76)	1.0(3)	13.6	.001
Beverages sold during school comply with Smart Snacks	87.4(125)	80.6(112)	4.7(13)	8.2	.017
Fundraisers selling foods have some restrictions	84.4(130)	69.5(98)	1.4(4)	11.9	.003
Physical Education (PE) and Physical Activity (PA)					
Formal written PE curriculum	83.0(117)	89.0(137)	1.0(3)	2.9	.319
Comprehensive school physical activity plan (CSPAP) created	9.1(14)	14.2(20)	1.7(5)	2.3	.324
Promotion of active transport to all students	36.4(56)	40.4(57)	8.7(25)	2.8	.242
Before- and after-school PA promoted	51.3(79)	59.6(84)	0.3(1)	2.8	.248
Daily recess for every grade in elementary school	67.8(103)	-	1.3(2)	-	-
Regular PA breaks provided	37.8(58)	14.9(21)	4.0(12)	23.4	<.001
Staff involvement required in PA	9.7(15)	9.2(13)	2.0(6)	0.6	.760
Family/community engagement in PA	35.7(55)	37.6(53)	0.3(1)	1.0	.605
PA training for all teachers	9.7(15)	4.3(6)	1.0(3)	3.7	.156
School Wellness Promotion and Marketing					
Specific strategies to promote PA outside PE	54.6(85)	54.6(77)	0(0)	0.0001	.991
Family wellness activities in nutrition/PA events	26.0(40)	22.0(31)	3.3(10)	1.1	.566
No non-Smart Snack foods/beverages					
Marketed on sports signage/equipment	92.5(124)	81.6(115)	6.7(20)	7.3	.007
Marketed in educational material	87.8(130)	85.1(120)	2.0(6)	0.5	.497
Marketed where foods are available/sold	79.6(117)	74.3(104)	2.7(8)	1.1	.286
Marketed on school media outlets	95.4(125)	88.7(118)	8.0(21)	4.0	.044
Marketed in fundraisers/corporate sponsorship	30.7(46)	40.3(56)	2.0(6)	3.4	.087

schools in districts with weak versus no policy language. For the Physical Education and Physical Activity items, implementation was also higher among schools in districts with strong policies compared to those in districts with weak policies (odds ratio: 4.36, 95% CI: 3.10, 6.12  $p < .0001$ ). The average likelihood of practice implementation was also higher schools in districts with weak policy language compared to schools in districts with no policies for Physical Education and Physical Activity items (odds ratio: 1.40, 95% CI: 1.12, 1.75,  $p = .003$ ). Overall, there was no difference in implementation levels for Wellness Promotion and Marketing practices.

Table 4 reports the results for the mixed effects logistic regression models for each subscale, and individual policy-practice item combination, stratified by grade level (elementary schools versus middle/high schools), adjusted for school enrollment, percent of students who were White, Hispanic, and eligible for free or reduced school meals. The adjusted percentages of schools implementing each practice in districts with no, weak or strong policy language are reported. When examined at the individual policy-practice combination item level, there were no significant differences in the percentage of schools implementing practices by district policy strength for the Nutrition Standards for Competitive Food or Physical Education

and Physical Activity items. The only item on the Wellness Promotion and Marketing subscale that had a significantly different percentages of schools implementing the practice concerned restricting non-Smart Snack marketing in fundraisers; the percentage of schools that restrict this type of marketing was higher in districts with weak policy language compared to districts with no policy.

## DISCUSSION

The aim of this study was to assess the presence and strength of written district wellness policies; the implementation of school-level practices; and the relationship between the two as part of an ongoing public health program in high-need districts in New York State. District policies most frequently addressed items in the Nutrition Standards for Competitive Foods domain, followed by the Physical Education and Physical Activity scale. In contrast, policies were least likely to address Wellness Promotion and Marketing. These results are not surprising because they reflect the history of wellness policy priorities. The original federal regulations on school wellness policies were monitored as part of the oversight of the federal food programs, so it makes sense that these items would receive the most attention by district committees. The physical education and activity items have also

**Table 4. Association between District-level Policy Strength, as Scored by the WellSAT 2.0, and Implementation Status in CHSC Schools, Stratified by Grade Level and Adjusted for School Enrollment and Percentage of Students Who are White, Hispanic, and Eligible for Free or Reduced-Price School Meals\***

CHSC Practice Item	WellSAT 2.0 Policy Item	% Elementary Schools Implementing Practices				% Middle/High Schools Implementing Practices				
		In Districts with Strong Policies	In Districts with Weak Policies	In Districts Without Policies	In Districts with Strong Policies	In Districts with Weak Policies	In Districts Without Policies	In Districts with Strong Policies	In Districts with Weak Policies	In Districts Without Policies
Nutrition Standards for Competitive Foods	Foods sold DURING school are Smart Snacks	90.6	85.4	86.1	72.8	59.7	47.4			
Vending machines/stores/concession foods comply with Smart Snacks	Foods sold AFTER school are Smart Snacks	86.1	93.1	82.2	67.4	69.1	55.3			
	Beverage sold DURING school are Smart Snacks	92.6	83.2	86.8	74.6	64.1	46.6			
	Beverage sold AFTER school are Smart Snacks	77.7	91.6	86.5	66.6	71.7	55.1			
Food served during celebrations have some restrictions	Regulation of foods served during elementary school celebrations	59.0	43.4	18.9	64.7	51.0	42.2			
Beverages sold during school comply with Smart Snacks	Beverage sold DURING school are Smart Snacks	88.0	88.2	85.8	84.5	86.5	69.9			
Fundraisers selling foods have some restrictions	Regulation of foods sold for fundraisers	65.9	82.8	85.3	48.5	71.3	53.6			
Physical Education (PE) and Physical Activity (PA)	Written PE curriculum K-12	98.4	70.0	89.6	96.2	61.0	80.3			
Formal written PE curriculum	Comprehensive Physical Activity (PA) plan	0.0	5.6	6.9	0.0	18.9	10.3			
Comprehensive school physical activity plan (CSPAP) created										
Promotion of active transport to all students	Active transport	65.5	32.7	41.2	67.1	46.0	38.1			
Before- and after-school PA promoted	Before/after school PA	46.4	50.5	47.7	65.5	58.3	52.2			
Daily recess for every grade in elementary school	Recess for elementary students	n/a	83.5	65.8	-	-	-			
Regular PA breaks provided	Physical Activity breaks	60.3	34.3	28.7	58.3	17.2	12.9			
Staff involvement required in PA	Staff involvement in PA opportunities	n/a	21.5	8.0	11.9	14.6	4.5			
Family/community engagement in PA	Family/community engagement in PA opportunities	9.4	37.2	37.4	20.8	54.7	31.1			
PA training for all teachers	PA training for all teachers	24.9	13.4	8.4	12.8	5.3	5.8			
School Wellness Promotion and Marketing										
Specific strategies to promote PA outside PE	Specifies ways to promote PA	76.2	57.5	40.6	71.9	64.1	45.7			
Family wellness activities in nutrition/PA events	Family wellness activities include nutrition/PA	14.9	26.7	26.1	32.9	29.5	21.6			
No non-Smart Snack foods/beverages	Non-Smart Snacks not marketed on sports signs/equipment	n/a <sup>†</sup>	79.5	92.3	90.4	84.3	83.4			
Marketed on sports signage/equipment	Non-Smart Snacks not marketed in educational materials	n/a	89.3	87.9	73.9	91.3	85.9			
Marketed in educational material	Non-Smart Snacks not marketed where foods are sold/available	n/a	75.3	80.1	n/a	75.1	68.1			
Marketed where foods are available/sold	Non-Smart Snacks not marketed in school media outlets	n/a	95.4	94.1	n/a	92.9	87.1			
Marketed on school media outlets	Non-Smart Snacks not marketed in fundraisers/corporate sponsorship	46.4 <sup>ab</sup>	52.3 <sup>b</sup>	23.9 <sup>a</sup>	21.2	42.7	35.3			
Marketed in fundraisers/corporate sponsorship										

\*Percentages in a column followed by the same letter are not statistically different at the .016 level of significance (which is p < .05 level of significance adjusted for three comparisons using a Bonferroni correction).

<sup>†</sup>Cells containing n/a indicate that there were no schools within the districts in the sample that had a strong policy for the item.

been recommended topics for wellness policies for the past decade, but historically, the policies related to physical activity have been less comprehensive and weaker than policies about nutrition.<sup>3</sup> The finding that the least discussed policies were those regulating food marketing in schools is also to be expected, as this is the newest domain from the HHFKA final rule on school wellness policy requirements.<sup>13</sup>

The findings on the rate of implementation of school wellness practices, and the relationship between written policy strength and practice implementation, suggest many factors may influence whether or not a practice is in place, such as the characteristics of the school building itself, the grade levels represented in those buildings, and the types of practices. To better understand why some policies and practices are in place while others are not, the Ambiguity-Conflict Model of Policy Implementation serves as a useful framework.<sup>14</sup> This model posits that the degree of ambiguity of a written policy and the amount of conflict arising during the implementation process are crucial to successful policy implementation.<sup>14</sup> For example, results of the present study indicate that across the three areas of practice and policy measured, the rate of practice implementation was highest for nutrition standards for competitive foods in elementary school buildings. In the Ambiguity-Conflict Model, this represents an area where there is low conflict, because it has become generally well accepted to restrict unhealthy food options available to elementary school students, and low ambiguity, because the barriers to implementation are relatively low. In other words, there are clear guidelines to support implementation and resource constraints are low. Consequently, the lack of a statistical association between policy and practice is not because the policy is being ignored; rather, it is because the best practice does not require the support of policy to be implemented. In contrast, the context is different in middle and high schools because the norm is to allow adolescents to make choices about the foods they purchase and consume. This represents a source of conflict, thus making the presence of a written policy more important to whether or not a best practice is implemented.

The Ambiguity-Conflict Model also provides an explanation for why the restriction of foods served during celebrations in elementary schools was more frequent when the school district had a stronger written policy on the topic. Because there is both more conflict about the practice of restricting foods in celebrations and there is a need for specific guidance to reduce ambiguity, it follows that school buildings in districts with stronger written policies addressing this topic would have higher rates of practice implementation.

In the physical activity and physical education domain, implementation rates were higher in school buildings within districts with strong versus weak

written policies, and higher in districts with policies compared to districts without policies. Although a practice like incorporating physical activity into the school day or promoting active transportation is not developmentally controversial, it can be challenging to implement because of restrictions on time in the school day, academic requirements, the built environment surrounding school buildings, or available facilities at a school building. For these practices, the presence of a strong and clear policy may be necessary to overcome barriers to implementation. Consistent with this, physical education and physical activity practices were the only category of practices where schools in districts with strong policies were significantly more likely to implement the practices than schools in districts with weak policies. Based on the Ambiguity-Conflict Model, the written policies related to physical education and physical activity would promote practice not only by resolving any inherent conflict about whether a practice should be followed but would reduce ambiguity by providing strong and clear guidance about requirements to support implementation.

Practices in the Wellness Promotion and Marketing domain concerning marketing of Non-Smart Snacks were implemented at a higher rate in middle/high school buildings than in elementary schools, but implementation was not associated with district written policies. The absence of a relationship is likely due to this being a relatively new area of practice, which could cause conflict during implementation. It could also be that policy language could be made less ambiguous, which in turn could help reduce conflict during practice implementation at the school building level.

### Limitations

The districts recruited to participate in CHSC had higher rates of eligibility for free and reduced lunch among students than the statewide average. This may limit the generalizability of the findings. The current study used a cross-sectional, one-time assessment of district wellness policies and practices within a 3-year period. Therefore, these data cannot be used to determine causality when policies and practices align because it is possible that the written policy preceded the practice implementation, or that the policy was written to correspond with ongoing practice. Additional studies using a longitudinal design are needed to assess how policies and practices may influence each other over time. A self-report measure that only covered the wellness practice topics covered within the CHSC program was used to assess school building practice implementation. This may be vulnerable to desirability bias. However, the fact that respondents listed many practices as not in place suggests that respondents were not inflating their reports of practice implementation.

## Conclusions

Taken together, these findings suggest that having a strong wellness policy overall predicts higher rates of wellness related practices in the aggregate. When examining subsets or individual items, the association between written wellness policies and practice implementation may depend on existing community norms about the acceptability of the practice the ease of implementation, and familiarity of the practice area. Policy may be more important for implementation when there is controversy about a practice, or ambiguity about how a practice should be instituted.

## IMPLICATIONS FOR SCHOOL HEALTH

District wellness committees can take the following steps to improve the strength of their wellness policies, ensure policy implementation, and comply with the new federal requirement to conduct a triennial assessment on compliance, alignment with model policies, and progress towards goals<sup>13</sup>:

- Evaluate the district policy using the WellSAT to identify which elements are strong, weak or missing;
- Assess whether the elements present in the policy are being implemented consistently across all schools in the district. If there are, develop an action plans to implement the practices consistently. This is particularly important for more controversial policies, such as restricting food sold in fundraisers or served at parties.
- Assess whether there are wellness practices that are being implemented but are not in the policy. If there are, add policy language to capture all wellness practices. Ideally, engage the Board of Education and administrators to write significantly stronger policies and regulatory guidance that uses language such as “will” and “shall” instead of “may” and “should” when describing desired wellness practices.

## Human Subjects Approval Statement

The research described in this article did not undergo human subjects review or approval because only administrative school-building and district-level data were collected and utilized for the study.

## Conflict of Interest

All authors of this article declare they have no conflicts of interest.

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