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## Factors Affecting School Health Scores: WellSAT Scores, School Policy, and the School Environment

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RUNNING TITLE: FACTORS AFFECTING SCHOOL HEALTH SCORES

Factors Affecting School Health Scores: WellSAT Scores, School Policy, and the School  
Environment

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Childhood health is a growing concern in America. A third of American children and adolescents are overweight or obese; 18% of children aged 6 to 11 years old are obese, a significant increase from 7% in 1980.<sup>1</sup> Childhood obesity impacts Americans in the form of rising healthcare costs to treat preventable diseases as well as increased susceptibility to chronic diseases that would normally occur at older ages. Obesity is associated with conditions such as Type II Diabetes, high blood pressure, high cholesterol, and cardiovascular problems, all of which are increasing in prevalence in youth. While childhood obesity rates have recently been reported as plateaued<sup>2</sup> and lowered, the rate is still much higher than in past decades and adult and youth rates have not significantly been lowered<sup>3</sup>. Brofenbrenner's socioecological model looks at changes in health behavior from all levels – individual influences to policy and structural influences. Of the many intervention approaches addressing childhood health issues, school-based health policy and education reform have been the focus in recent research with more immediate – and visible - results.

Research conducted by the Centers for Disease Control and Prevention has shown that school health interventions implemented through policy reform have been effective in improving physical activity, health education, school meals, and the presence of competitive foods and beverages in schools.<sup>4-5</sup> Taking a multi-faceted approach to improving school health policy is important for standardization and to promote good student health, but recent attempts to intervene focused more on changing nutrition and physical activity policies<sup>6</sup>. Efforts have been made to improve federal school lunches, but there has been student backlash due to taste and perception of the newer lunches<sup>7</sup>. This is just one example of how approaches in policy change may not go the way as idealistically expected by school officials and policymakers. Though

policies and procedures may be put in place to benefit student health, students may not see the point and school staff may find implementing new policies a hindrance to their normal routine.

Schools are now starting to focus on school health and wellness policies thanks to a change in federal law.<sup>8</sup> The 2004 Child Nutrition and WIC Reauthorization Act mandated the development of school health and wellness policies by every school district participating or wanting to participate in federal school meal programs before the start of the 2006-2007 school year.<sup>9</sup> The state of Kentucky – where this study conducted its analysis – was changing education legislation in 1990. A 1989 ruling by the Kentucky Supreme Court on the case *Rose v. Council for Better Education* found that the state’s education system was inefficient and unequally funded, thus violating the 14<sup>th</sup> Amendment. Because of this, Kentucky Education Reform Act (KERA) of 1990 was passed, which created a complete overhaul of the State of Kentucky’s public education policies.<sup>10</sup> One of those policies (specifically, KRS 160.345) included the creation of Site-Based Decision Making (SBDM) Councils in every public school; these councils comprised of teachers, administrators, and parents to create individual school policies, including health and wellness policies.<sup>11</sup> These SBDMs should be considered a “laboratory” for policy creation; while district policies meet minimum federal standards, SBDM councils can potentially create stricter policies.

Policy typically focuses on improving standards in facets such as health education curriculum, required physical activity, school food nutrition, competitive foods, vending machines, and teacher training.<sup>12-14</sup> While schools are writing more comprehensively in their school health policies and are more willing to make these changes.<sup>15</sup> However, most of this work is rather new and focuses on the creation and strength of policies, rather than enforcement, implementation, and actual health outcomes of students. While school board members,

administrators, and researchers believe that school health policies can be easily changed,<sup>16</sup> one must consider the impact on the faculty and staff that are expected to enforce the rules on a regular basis.

One must also consider the characteristics of the school and students, particularly from the end of funding and socioeconomic status. Recent data shows 27% of Kentucky children living in poverty, 35% have no parent with full-time employment, 42% of Kentucky children and teens not exercising regularly, and 36% of Kentucky children and teens considered overweight.<sup>17</sup> To help assist in offering more children free and reduced school meals, Section 104(a) of the Healthy, Hunger Free Kids Act of 2010 established a lower Free and Reduced Lunch Rate (FRLR) of 40% to qualify schools for Community Eligibility Option (CEO); meaning that if the school's FRLR is 40% or higher, the school can offer the entire student body free and reduced breakfast and lunch without requiring students to fill out applications for the service. This was first tested in a small number of states (Illinois, Michigan, Kentucky, West Virginia, New York, Ohio, and Washington, D.C.) when the Act was passed, but now the lower CEO rate will be enacted nationwide starting during the 2014-2015 school year.<sup>18</sup>

This study intended to specify, if possible, any differences found in written school health policy and potential factors that play into the school environment: socioeconomic status, type of school, and the existence of policies created within the individual school. This work could further assist school systems in understanding which policies have a greater impact on student health, and why they make that impact. Choosing to take on more effective policy changes can save financially challenged school boards time and funding in the long run. This study can also provide researchers and practitioners a set of lessons learned from less effective policy changes

so that the concepts can either be improved or phased out altogether from future policy initiatives.

While many schools with strong written policies will also have strong enforcement, some schools may have strong written policies, but do not enforce written policy to the fullest extent.<sup>19</sup> This study will explore factors that could potentially affect WellSAT nutrition scores. First, are strength and comprehensiveness scores on the WellSAT statistically significant? From there, do socioeconomic status (using FRLR as a proxy), the type of school, and whether the school has a separate policy from the district affect WellSAT scores?

## **Methods**

Data on policies were collected in the Summer of 2013 to look at accessibility and comprehensiveness of school health policies from online sources (district websites, individual school websites, and other online sources). Final analysis included 91 individual schools (including elementary schools, middle schools, junior high schools, and high schools) within 16 public school districts in the Northern Kentucky area. The districts and schools were selected because of their location within the coverage area of the local health department. All public schools in the area were included because all had at least a district health and wellness policy available; Head Start programs, daycares, preschools, private schools, and alternative schools (such as juvenile detention schools) were excluded due to their lack of available policies or policies that were not thorough enough to be scored with the WellSAT.

District websites and policies were collected first, followed up by searching each individual school's website. There was no recruitment, as the researcher was initially checking district and school websites for policy accessibility and availability. If school health policies were available, they were analyzed by a graduate intern for comprehensiveness using Yale Rudd

Center for Food Policy and Obesity's Wellness School Assessment Tool (WellSAT). The WellSAT takes qualitative data – in this case, the wording used in the policies – and gives it a corresponding quantitative score between 0 and 4, with 0 indicating that the policy is nonexistent and 4 indicating that it meets high standards of health recommendations from professional organizations such as the Institute of Medicine.

Because of the interest in nutrition-based policy work, both nationally and within the Northern Kentucky Health Department, this study focused on analyzing the three WellSAT categories that were based around food and nutrition policies (Nutrition Education and Wellness Policies, USDA Meal Standards, and Nutrition Standards) by combining the categories and creating a new Total Nutrition (TN) category, keeping the strength and comprehensiveness scores. Then, the scores were dichotomized by the median; scores below the median were considered “low scoring schools” and scores above the median were considered “high scoring schools.”

Using SPSS 21, two sample t-tests were conducted on the Total Nutrition Scores (strength and comprehensiveness) and Free and Reduced Lunch (FRL) rates. Then, chi-square tests were conducted on the Total Nutrition Scores (strength and comprehensiveness; low scoring and high scoring schools) when compared to the type of school (elementary or secondary), whether a school had a separate policy from the school district, and whether the school qualified for CEO (40% or higher FRL). Finally, based on the chi-square test results, a logistic regression was conducted with the Total Nutrition Scores (comprehensiveness only), whether a school had a separate policy from the school district, and the type of school (elementary or secondary).

## **Results**



Table 1 presents descriptive statistics and mean WellSAT scores before the t-tests, chi-square, and logistic regression tests were run. Based on this table alone, one can make out numerous points that would be of interest. First, only 21.97% of schools within the Northern Kentucky area – all of which are required by state law to have SBDM Councils – had separate health and wellness policies from district policy that were easily accessible. Second, the mean FRLR in the area was 43.43%; the new Healthy, Hunger Free Kids Act of 2010 has established 40% FRLR as the minimum for Community Eligibility Option. It should also be noted that the median FRLR was precisely at 40%, which is the minimum CEO eligibility rate.

Third, average WellSAT scores indicate more of a focus on comprehensiveness in policy rather than the strength. For example, many policies mention vague stipulations on improving dietary guidelines of school meals (making the policy more comprehensive) instead of requiring specific numbers and percentages for fat, sodium, or calorie count (making it a stronger policy). This also shows that a policy that is comprehensive is not necessarily a strongly written policy; total comprehensiveness average scores were 45.29, while total average strength scores were a 12.85. Finally, the average category scores would show more of a focus on food and nutrition-based policies; with the exception of the high evaluation comprehensiveness scores, nutrition education and wellness curriculum and USDA meal standards were the highest averages in both comprehensiveness and strength.

<u>Grade Level of School</u>	<u>N (%)</u>
Elementary	55 (60)
Secondary	36 (40)
<u>Did the School Create a Policy Separate from the School District?</u>	<u>N (%)</u>
Yes	20 (21.97)

No	71 (78.02)
<u>Free and Reduced Lunch Rate</u>	<u>Percentages</u>
Mean	43.43
Median	40.00
Standard Deviation	24.73
<u>Schools with FRL that meet new Community Eligibility Option Standards</u>	<u>N (%)</u>
Yes (40% or higher)	46 (50.5)
No (39% or lower)	45 (49.5)
<u>Average WellSAT Scores - Comprehensiveness</u>	<u>Score (Out of 100)</u>
Nutrition Education and Wellness Curriculum	55.6501
USDA Meal Standards	67.3586
Nutrition Standards	36.7555
Physical Education and Physical Activity Evaluation	25.7709
Total	89.2857
	45.2967
<u>Average WellSAT Scores - Strength</u>	<u>Score (Out of 100)</u>
Nutrition Education and Wellness Curriculum	15.3885
USDA Meal Standards	25.5830
Nutrition Standards	8.7060
Physical Education and Physical Activity	11.5019

Evaluation	10.1648
Total	12.8571

**Table 1: Descriptive Data on Schools, Free and Reduced Lunch, and average WellSAT scores**

Two initial t-tests were done to find any potential association between the Total Nutrition Scores and FRL rates (Table 2). The results of this test were found statistically insignificant, therefore no strong association was found.

WellSAT TN Score	Below the Median	Mean	Above the Median	Mean	t-value	Sig.
Strength	46	42.34	45	44.51	.41	.68
Comprehensiveness	46	42.13	45	44.76	.51	.61

**Table 2: t-test results - FRL rates and WellSAT TN Scores**

With the rest of the potential factors, chi-square tests were ran along with the strength and comprehensiveness Total Nutrition Scores (Tables 3.1 – 3.6). All factors compared to strength Total Nutrition Scores were found statistically insignificant. However, two of the three analyzed factors – whether a school had a separate policy from the district and the type of school – were found statistically significant when compared to comprehensiveness TN scores.

Type of School	Total Nutrition (TN) - Strength		X <sup>2</sup> statistic	p value
	WellSAT Scores above Median (n=45)	WellSAT Scores below Median (n=46)		
Elementary	45.5%	54.5%		
Secondary	55.6%	44.4%		
Total	49.5%	50.5%		
Pearson's Correlation	-	-	.888	.35

**Table 3.1: Chi-Square Test for Independence, TN Strength Scores and Type of School**

Type of School	Total Nutrition (TN) - Comprehensiveness		X <sup>2</sup> statistic	p value
	WellSAT Scores above Median (n=45)	WellSAT Scores below Median (n=46)		
Elementary	58.2%	41.8%		
Secondary	36.1%	63.9%		
Total	49.5%	50.5%		
Pearson's Correlation	-	-	4.24	.04

**Table 3.2: Chi-Square Test for Independence, TN Comprehensiveness Scores and Type of School**

Separate Policy from the District	Total Nutrition (TN) - Strength		X <sup>2</sup> statistic	p value
	WellSAT Scores above Median (n=45)	WellSAT Scores below Median (n=46)		
Yes	45.0%	55.0%		
No	50.7%	49.3%		
Total	49.5%	50.5%		
Pearson's Correlation	-	-	.203	.65

**Table 3.3: Chi-Square Test for Independence, TN Strength Scores and Schools with Separate Policies from District**

Separate Policy from the District	Total Nutrition (TN) - Comprehensiveness		X <sup>2</sup> statistic	p value
	WellSAT Scores above Median (n=45)	WellSAT Scores below Median (n=46)		
Yes	30.0% (n = 6)	70.0% (n = 14)		
No	54.9% (n = 39)	45.1% (n = 32)		
Total	49.5%	50.5%		
Pearson's Correlation	-	-	3.88	.05

**Table 3.4: Chi-Square Test for Independence, TN Comprehensiveness Scores and Schools with Separate Policies from District**

Was the School Eligible for CEO under new Regulations (40% +)	Total Nutrition (TN) - Strength		X <sup>2</sup> statistic	p value
	WellSAT Scores above Median (n=45)	WellSAT Scores below Median (n=46)		
No (39% or lower)	48.9% (n = 22)	51.1% (n = 23)		
Yes (40% or higher)	50.0% (n = 23)	50.0% (n = 23)		
Total	49.5%	50.5%		
Pearson's Correlation	-	-	.011	.92

**Table 3.5: Chi-Square Test for Independence, TN Strength Scores and CEO Eligibility**

Was the School Eligible for CEO under new Regulations (40% +)	Total Nutrition (TN) - Comprehensiveness		X <sup>2</sup> statistic	p value
	WellSAT Scores above Median (n=45)	WellSAT Scores below Median (n=46)		
No (39% or lower)	48.9% (n = 22)	51.1% (n = 23)		
Yes (40% or higher)	50.0% (n = 23)	50.0% (n = 23)		
Total	49.5%	50.5%		
Pearson's Correlation	-	-	.011	.92

**Table 3.6: Chi-Square Test for Independence, TN Comprehensiveness Scores and CEO Eligibility**

Due to these two factors (type of school and separate policies) being found significant when compared to TN comprehensiveness scores, a logistic regression was conducted to see if these factors affected the TN comprehensiveness scores independently from one another (Table 4). Using the Adjusted Odds Ratio (AOR) from the logistic regression analysis, secondary schools are 3.65 times more likely to be at risk of having lower WellSAT nutrition scores compared to their elementary school counterparts. As for schools that do not create separate policies from the district, they are 78% less likely to be at risk of lower WellSAT nutrition scores.

Factor	AOR	C.I. (95%)	p value
Type of School (Elementary or Secondary)	3.65	1.41 – 9.43	.008
Having a Separate Policy from the District	.22	.07 - .70	.01

**Table 4: Logistic Regression Results**

### Discussion

There are several takeaway findings that should be discussed. First, the strength scores were not only found to be much lower on average compared to comprehensiveness scores, but were also were not found to be statistically significant when running statistical analyses. This should be seen as a sign that schools and school districts should start focusing more on the strength of the wording used in their written policies. Creating not only more comprehensive, but stronger, policies makes it easier for school staff and faculty to enforce, thereby making strides in student health improvement. Second, looking at socioeconomic status with FRL rates as a proxy found no statistical significance. This could be a signal that this factor does not play a role in actual policy creation, which could be seen as a good sign when one considers policy creation and intervention in areas with lower socioeconomic status, such as urban and rural schools.

Third, nutrition WellSAT scores were more likely to be lower in secondary schools, in this case middle school, junior high, and high schools. One potential reason for this finding could be due to more active and involved parents contributing to SBDM councils and their health and wellness policies. Though it is encouraging to find elementary schools having higher scores, the lack of stronger and more comprehensive policies in secondary schools can be counterproductive due to a lack of reinforcement of behaviors and lessons taught to students during their time in elementary school.

Finally, individual school health and wellness policies, when looked at separately from their district's policies, are not strong or comprehensive as a stand-alone document. This finding may stem from individual school policies are created as addendums to district policy.

The findings of this study can be used to show that the push towards healthier schools from a policy standpoint is progressing. The fact that this research stemmed from a Coordinated School Health program in a public health department can potentially influence the public – and the public health workforce – that public health departments can make a difference in school health in the form of policy intervention and consultation, in turn making more jobs within the public health workforce. Public health department work within schools can also create a strong community partnership that can be beneficial in smaller, rural communities by offering preventative care services and in-school health programming.

There are a few limitations that should be mentioned regarding this study. A small number of private schools, alternative schools, and day care centers were not analyzed due to significance. Another limitation with data collection for this study is that the initial intent of the project was not only based on scoring policies, but also looking at online accessibility of school policy; while all district policies were available on the state Department of Education website, some individual school websites were outdated, nonfunctioning, or generally hard to access. For these reasons, some schools may have policies (or more updated policies than what were listed) but were not available.

However, this statistical limitation brings up a strong qualitative point of Internet access and accessibility in rural communities. Rural communities may not have the technological capabilities (connection, connection speed, trained staff) to make policies accessible, which is a detriment in today's society of instant access and freedom of information. Parents that are

searching for policies or health information may not get accurate information because the school does not have the online capability. From the perspective of KERA, many school websites did not have accurate or available information on SBDM Council members, meeting times, or previous meeting information. Considering SBDM Councils are part of KERA, this lack of updated information also brings up issues regarding enforcement of this stipulation of the act.

As for limitations with the statistical analysis, the WellSAT tool was manipulated slightly when the nutrition-based categories were combined and dichotomized. The WellSAT tool is also typically used to only score district policies, while individual schools policies were scored with the same tool for this study.

When considering future research in this area, the idea of policy enforcement should also be addressed. Yale's Rudd Center for Food Policy & Obesity has already started creating a tool to complement the WellSAT – the WellSAT-I (Wellness School Assessment Tool – Implementation). The WellSAT-I delves further into school policy by using qualitative data collection through interviews and observation to see how policy is actually enforced compared to how it is written down. The Northern Kentucky Health Department has been working with the Rudd Center in beta testing this new tool, with results to be released at a future time.



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