

# The Relationship Between School-Based Health Centers and the Learning Environment

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## ABSTRACT

**BACKGROUND:** School-based health centers (SBHCs) have improved access to primary and preventive health care for underserved children and youth by bringing comprehensive health services into the schools while addressing critical health problems that make it difficult for students to learn. Despite the findings on the positive effects of SBHCs on health outcomes, the literature investigating the relationship between SBHCs and the learning environment is scant. This purpose of this study is to add to the literature by investigating the correlation between SBHCs and perceptions of the overall school learning environment.

**METHODS:** This study investigates the relationship between SBHCs and the learning environment utilizing a retrospective quasi-experimental design. Researchers used secondary data from the 2007 Board of Education Learning Environment Survey (LES) of a large northeastern city to compare schools with SBHCs and schools without SBHCs.

**RESULTS:** The findings demonstrate that the presence of a SBHC is associated with greater satisfaction in 3 out of 4 learning environment domains.

**CONCLUSIONS:** Perhaps by helping to eliminate the barriers that affect lower-performing students' readiness to learn, while improving student and parent engagement, SBHCs can partner with schools to reach their performance and accountability goals.

**Keywords:** school health services; school-based clinics; research.

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Thousands of school-aged children throughout the country have limited access to health care because of financial, geographical and other barriers to care.<sup>1</sup> School-based health centers (SBHCs) have improved access to primary and preventive health care for underserved children and youth by bringing comprehensive health services into the schools while addressing critical health problems that make it difficult for students to learn.<sup>2-7</sup>

Since the implementation of the No Child Left Behind Act of 2001 (Public Law 107-110), there has been increased pressure on schools to be accountable for demonstrating the impact of all its programs (including SBHCs) on improving the learning environment and academic outcomes.<sup>8,9</sup> The literature suggests that both student health and the school learning environment influence academic performance.<sup>10-12</sup> Research studies have investigated a link between SBHCs and academic performance indicators primarily through the link of improved health outcomes.<sup>8,11,13-15</sup> For instance, there is a correlation between asthma and lower student attendance.<sup>15</sup> Specifically, an evaluation of children with asthma found that those attending schools with a SBHC had fewer hospitalization days, and school absences, compared with children at control schools without a SBHC.<sup>16</sup> Several other researchers also found a positive relationship between SBHC use and attendance.<sup>17,18</sup> Another study found a significant correlation between SBHCs and educational aspirations.<sup>19</sup> Grade promotion and graduation rates were also found to be significantly greater among SBHC users as compared to nonusers.<sup>9</sup>

Despite the findings on the positive effects of SBHCs on health outcomes, the literature investigating the effectiveness of SBHCs on improving academic outcomes or the learning environment is scarce. Geierstanger and colleagues state, "By concentrating efforts on documenting the link between SBHCs and improved health status, as well as other activities that SBHCs are involved in that enhance students' learning environments, there is the greatest potential of showing a link, albeit indirect, between SBHCs and academic performance."<sup>8(p352)</sup>

### **School-Based Health Centers and the Learning Environment**

The learning environment consists of values and conditions that sustain or hinder learning<sup>3</sup> such as academic expectations, schoolwide communication, student engagement, and safety and respect. Teachers, principals, students, and parents all have influence on the learning environment and the context within which learning occurs in any particular school. In addition, the learning environment is influenced by the services that are provided by the school, such as a school-based health center. Studies have shown

that a positive learning environment leads to better academic achievement and student adjustment in the classroom.<sup>20,21</sup>

In 2000, the National Governor's Association stated that policy makers should focus on eradicating the barriers that affect "lower-performing students' readiness to learn." One way of achieving this may be by improving the school learning environment through health- and education-related services provided by SBHCs. Many SBHCs offer additional schoolwide services to enhance school climate, such as health education, nutrition services, physical education, mental health services, and parental and community involvement.<sup>15</sup> By reaching out beyond the walls of the health center, the SBHCs may have a dispersion effect on multiple aspects of the overall school learning environment.

The National assembly on School-Based Health Care<sup>22</sup> has suggested that the existence of the SBHC on the school campus may serve to be a stabilizing effect upon the school atmosphere through the comprehensive provision of health-related services throughout the school community. For instance, faculty may obtain needed assistance in curriculum development for health-related content or have access to immediate assistance with a child who is experiencing an acute asthma attack in the classroom. Both of the above examples may be linked to increased teacher satisfaction which has in turn been linked with student performance.<sup>23</sup>

Students may feel an increased sense of school connectedness and engagement due to a relationship that has developed with a member of the SBHC staff. SBHC-led ancillary student groups focused on health and youth development may also provide an additional outlet for students to become engaged in school. Further, students and parents may feel safer knowing that there are school health providers on campus. Finally, coordinated communication between students, parents, teachers, school administration, and the broader community may often be facilitated by community health liaison staffed at the health centers.

In summary, SBHCs are not only involved in the provision of health-related services, but often also provide other services to the larger school community that may enhance the overall learning environment. These activities include teaching part of a school health education curriculum, developing school safety protocols, serving on school planning or service collaboration committees, providing after-school programs for parents and students related to asthma care or healthy eating and exercise habits. They also provide important health services that might result in fewer student absences, thus increasing the amount of time available for a student to learn in the classroom. It is through this theoretical lens that the structure of the current study is built.

Therefore, it is the purpose of this study to add to the literature by investigating the correlation between SBHCs and the overall school learning environment. It is hypothesized that the presence of the SBHCs will provide a more optimal learning environment than schools without a SBHC.

## METHODS

This study investigates the relationship between SBHCs and the learning environment utilizing a retrospective quasi-experimental design. Researchers used secondary data from the 2007 Board of Education Learning Environment Survey (LES) of a large northeastern city to compare schools with SBHC and schools without SBHC. The research question is: "Will schools with SBHCs have a more optimal learning environment than schools without SBHCs?"

### Procedures

The Department of Education (DOE) conducts a LES as part of an effort to improve student academic outcomes and promote school accountability. The LES collects information from parents, teachers, and grade 6-12 students in 4 different domains: SR, communication, engagement, and AB. According to the DOE documents,

Elementary school parent surveys were distributed to students in school to be delivered to their parents at home. Middle and high school parent surveys were mailed directly to parents homes. Teacher surveys were distributed to faculty mailboxes. Parents and teachers also had the option to complete surveys online. Student surveys were administered during class time. All parents and teachers returned their completed surveys in pre-addressed, postage-paid envelopes. Schools collected and returned completed student surveys. The survey administration period lasted 6 weeks, from April 30 to June 6, 2007.<sup>24(p2)</sup>

### Subjects

The population of interest for this study consists of all of the public schools in a large northeastern city. The sample for this study was drawn from 1373 schools. Approximately 30% or 416 schools were chosen for this study. It is important to state that the unit of analysis for the current study is *not* the individual teacher, parent, and student, but rather the data are analyzed in aggregate at the school level; therefore, the sample size refers to the number of schools, not the number of individuals who participated in the surveys at each school. Individual-level data were not made available by the DOE.

The sample was a purposive sample, meaning that all schools served by a SBHC were purposefully selected into the study (N = 208) along with matched schools with no SBHCs (N = 208). The parent response

rate for the 416 schools selected into this study was 21% compared to 25% who responded citywide. Student response rates were higher for this study's sample than the citywide sample (62% vs 66%, respectively). Forty-two percent of the teachers in the study schools responded to the surveys, while 44% of teachers citywide participated in the survey. There were no significant differences in the response rates between the schools with SBHCs and the comparison schools for any of the groups of participants ( $p > .05$ ).

The comparison group was selected using propensity score matching (PSM) and the nearest neighbor technique. PSM is a correction strategy that attempts to correct for the selection bias.<sup>25</sup> Rosenbaum and Rubin<sup>26</sup> developed the propensity score method to provide an alternative for estimating treatment effects when treatment assignment is not random. In this case, the SBHC is considered the treatment. Propensity scores help to equalize the likelihood that a participant is selected for the treatment, thus mimicking randomization. The analysis uses logistic regression to obtain a predicted probability of group membership based on observed predictors. Rather than matching on several variables, group equivalence can be obtained by using one inclusive score of several covariates.

In this study 5 covariates were included in this analysis that yielded the propensity score: race/ethnicity, poverty (free lunch), enrollment, % special education, and % English-language learners. Nearest neighbor matching was used to match the SBHC school with the non-SBHC school with the closest propensity score while controlling for school type (elementary, middle, high) and size. Each group consisted of 208 schools.

Table 1 compares the SBHC group to the non-SBHC group on demographics before PSM and after. As illustrated in the table, you can see that the PSM was successful at selecting a comparable group of schools based on the observed demographic variables. Before the PSM, % poverty, % English-language learners, % Hispanic, and % White were all significantly higher in the SBHC schools than the comparison group, while % Asian was approximately 7% lower in the SBHC group. After the PSM, there were no statistically significant differences between the two groups on any of the demographic variables.

### Instruments

Using information gathered in 35 focus groups held with key stakeholders in the community, the DOE Office of Accountability designed survey questions targeted specifically to improving learning conditions in the city's schools. A total of 390 parents, teachers, students, and key professionals suggested a variety of topics.<sup>27</sup> Across groups 4 issues most consistently emerged as major characteristics of a positive learning environment: communication, engagement, academic expectations, and SR. The survey questions are asked

**Table 1. Demographic Differences Between SBHC Schools and Comparison Group Before and After the Propensity Score Matching**

Demographic Variable	SBHC Pre-/Post-PSM	Comparison Group	Comparison Group
		Pre-PSM	Post-PSM
Poverty	72.7%	66.2%*	72.5%
Eng.-language learner	17.8%	13.4%*	16.2%
Special Ed	13.4%	13%	13.8%
Enrollment	711	712	711
Hispanic	53.3%	38.2%*	51.3%
Black	36.4%	35.1%	38.2%
White	4.4%	1.4%*	4.3%
Asian	4.3%	11.9%*	5.4%
Native American	.47%	.4%	.44%

\* $p \leq .001$ .

on a Likert-type scale with assigned scores ranging from 0 to 10 to ease interpretation. More specifically, a score of 10 was assigned to the rating *Strongly Agree*, *Agree* received 6.7 points, *Disagree* equals 3.3 points, and *Strongly Disagree* is equal to 0 points. The database consists of the culminated school data. The individual scores are not provided, so only the overall school means are compared in this study. All domain scores for the 2 groups were calculated by taking the aggregate mean scores from each of the 416 study schools.

Reliability and validity of the instrument was established for the survey.<sup>26</sup> Cronbach's reliability analysis demonstrated high alpha scores for each of the domains. Each subject group had alphas ranging from .75 to .95.<sup>28</sup> Overall alpha scores for each individual domain are reported below.

Evidence of convergent and discriminant validity was established, suggesting construct validity for each of the 4 domains. Specifically, Rockoff and Speroni correlated the LES to 4 other measures of school quality and found significant relationships, suggesting that the LES has construct validity as a measure of school quality.<sup>26</sup>

*Academic Expectations* consisted of 18 questions such as "The school has high expectations for my child," "Teachers in this school set high standards for students" work in their classes," and "The adults at my school help me understand what I need to do to succeed in school." The overall Cronbach's alpha reliability for this domain was measured at .96.

*Communication* was measured by 7 questions such as "How comfortable are you talking with teachers or other adults in your school about a problem you are having?" "Most of the adults I see at school every day know my name or who I am," and "The school contacts me to inform me about my child's achievements and successes." The overall Cronbach's alpha reliability for this domain was measured at .94.

*Engagement* consisted of 12 questions such as "The adults at my school look out for me," "My school

offers a wide enough variety of activities or courses to keep students engaged at my school," and "School leaders encourage collaboration among teachers." The overall Cronbach's alpha reliability for this domain was measured at .96.

*Safety and Respect* was measured by 22 questions such as "There is an adult at the school whom my child trusts and can go to for help with a school problem," "The presence and actions of school safety agents help to promote a safe and respectful learning environment," and "Students use alcohol or illegal drugs during school." The overall Cronbach's alpha reliability for this domain was measured at .98.

## Data Analysis

Descriptive statistics, *t*-tests and analysis of variance (ANOVA) were used to determine significance of mean differences between SBHC and comparison groups on various demographic and learning environment variables. Linear regression was utilized to determine the relationship between being from a SBHC school and overall consumer satisfaction with the learning environment when controlling for poverty, enrollment, school type, special education, and English-language learners.

## RESULTS

### Demographics

Demographics for the study were obtained from 2 sources within the DOE databases: the LES and the citywide School Report Card Data. There were no statistically significant differences between the SBHC group and the comparison group of schools on any of the demographic variables, suggesting that the groups are equivalent and matching techniques were effective.

**Poverty.** Free and reduced lunch is often used as a proxy for poverty in research studies because actual poverty levels are not made available.<sup>29,30</sup> Free lunch is also used as a proxy for poverty in this study. A student is eligible to receive free lunch if his or her family income is no greater than 130% (elementary) or 185% (secondary) of the poverty level. Nationally, among the 100 largest school districts, the average number of students eligible for free lunch is 49%. In this sample, approximately 73% of students in both school groups received free lunch, suggesting the high prevalence of poverty across both school groups ( $t = .02$ ,  $df = 1$ ;  $p = .886$ ).

**English-Language Learners.** Approximately 16% of the students in the comparison schools and 18% in the SBHC schools are English-language learners ( $t = 1.08$ ,  $df = 1$ ;  $p = .30$ ). Although there were a greater percentage of students identified as English-language learners in the SBHC group, there was no statistically significant difference.

**Special Education Services.** The national average of students who receive ESL services is 11%. Approximately 14% of the students in the comparison schools and 13% in the SBHC schools are receiving special education services ( $t = .529$ ,  $df = 1$ ;  $p = .47$ ).

**Enrollment.** In both the comparison and SBHC schools, the average enrollment is 711 students. The enrollment ranged from 74 students to 4465 students. The median enrollment for the SBHC schools is 522, and 515 students for the comparison schools.

**Race/Ethnicity.** The majority of the students in both school groups identify themselves as Hispanic, followed by Black, White, Asian, and Native American. Table 1 illustrates the demographics of the 2 groups.

### Learning Environment Domains

The learning environment outcomes were measured for each of the 3 groups of participants: students, parents, and teachers. The following subsections describe the findings for each individual group. The student group only includes students in and above the sixth grade.

**Academic Expectations.** Students in schools with SBHCs rated academic expectations significantly higher (7.0) than students in the comparison group (6.8) ( $t = -2.13$ ,  $df = 301$ ;  $p = .034$ ). Parents in schools with SBHCs also rated academic expectations significantly higher (7.3) than parents in the comparison group (7.0) ( $t = -2.13$ ,  $df = 414$ ;  $p = .033$ ). There was no significant difference between how teachers in schools with SBHCs rated academic expectations versus teachers in the comparison group.

**Communication.** Students in schools with SBHCs rated communication higher (5.7) than students in the comparison group (5.5); however, the difference was not statistically significant ( $t = -1.85$ ,  $df = 301$ ;  $p = .066$ ). Parents in schools with SBHCs rated communication significantly higher (7.1) than parents in the comparison group (6.9) ( $t = -2.68$ ,  $df = 414$ ;  $p = .008$ ). There was no significant difference between how teachers in schools with SBHCs rated communication versus teachers in the comparison group.

**School Engagement.** Students in schools with SBHCs rated school engagement significantly higher (6.5) than students in the comparison group (6.3) ( $t = -2.38$ ,  $df = 301$ ;  $p = .018$ ). Parents in schools with SBHCs also rated school engagement significantly higher (6.2) than parents in the comparison group (6.0) ( $t = -3.07$ ,  $df = 414$ ;  $p = .002$ ). There was no significant difference between how teachers in schools with SBHCs rated SE versus teachers in the comparison group.

**Safety and Respect.** Students in schools with SBHCs rated safety and respect higher (6.0) than students in the comparison group (5.9), however, the difference

was not statistically significant ( $t = -1.69$ ,  $df = 301$ ;  $p = .092$ ). There was no significant difference in the rating of SR between SBHC schools and the comparison group for parents or teachers.

### Overall Perceptions of Parents and Students

Linear regression was utilized to determine the relationship between being from a SBHC school and overall consumer satisfaction with the learning environment when controlling for poverty, enrollment, school type, special education, and English-language learners. One score, called *consumer satisfaction*, was computed by the research team to calculate the overall satisfaction of parents and students with the learning environment. The results of the regression suggest a strong overall model. The score was computed by combining and taking the average of the 4 learning environment domains for parents and students. The adjusted r square accounts for the number of variables in the equation and illustrates that 36% of the variation in consumer satisfaction can be accounted for by SBHC and the control variables. The slope suggests that SBHC consumers rate the learning environment better by approximately 1 point (.80) as compared to the non-SBHC consumers (Table 2).

### DISCUSSION

The findings demonstrate that the presence of a SBHC is associated with greater satisfaction on 3 out of 4 of the learning environment domains. In general, schools with SBHCs were perceived more favorably by students and parents than schools without health centers. Specifically, students and/or parents rated the following aspects of the learning environment more favorably: academic expectations, communication, and school engagement (Table 3).

This study offers evidence that the presence of SBHCs in the urban schools has enhanced certain aspects of the learning environment for students and parents. For example, some of the SBHCs provide the school with community health liaisons who engage parents and students by offering weekend classes on

Table 2. Linear Regression Analysis Summary for SBHC and Control Variables Predicting Consumer Satisfaction With the Learning Environment

Variable	B	SEB	Beta
SBHC	.80	.4	.09*
Poverty	-.02	.02	-.09
Eng.-language learner	6.0	1.4	.23 <sup>†</sup>
Enrollment	-.01	.000	-.42 <sup>†</sup>
School type	-.77	.144	-.26 <sup>†</sup>
Special Ed	-18.8	3.5	-.27 <sup>†</sup>

Note.  $R^2 = .38$  ( $N = 303$ ,  $p < .001$ ).

\* $p \leq .05$ .

<sup>†</sup> $p \leq .001$ .

Table 3. Overview of Learning Environment Findings

Participant Group	Learning Environment Outcomes Comparison Schools vs SBHC Schools			
	Communication	Safety and Respect	School Engagement	Academic Expectations
Students	5.5 vs 5.7*	5.8 vs 6.0*	6.3 vs 6.5 <sup>†</sup>	6.9 vs 7.1 <sup>†</sup>
Parents	6.9 vs 7.1 <sup>‡</sup>	7.4 vs 7.4 <sup>NS</sup>	6.0 vs 6.3 <sup>‡</sup>	7.0 vs 7.2 <sup>‡</sup>
Teachers	5.5 vs 5.5 <sup>NS</sup>	6.1 vs 6.1 <sup>NS</sup>	5.4 vs 5.4 <sup>NS</sup>	6.3 vs 6.4 <sup>NS</sup>

\*SBHC has higher scores than non-SBHC schools  $p < .10$ .

<sup>†</sup>SBHC has significantly higher scores than non-SBHC schools  $p < .05$ .

<sup>‡</sup>SBHC has significantly higher scores than non-SBHC schools  $p < .01$ .

NS, no difference between groups.

healthy cooking techniques and family fun exercise activities. Thus, many of the SBHC services may improve communication and engagement with students and parents who attend the school despite whether they actually use the SBHC services. Further, perceptions of engagement and communication may be increased due to the influence of a personal connection that is forged between the SBHC staff and a student or parent. Finally, SBHCs offer medical services within the school setting that facilitate less time away from the classroom, which improves attendance and seat time in the classroom, and therefore may influence academic performance outcomes.

The learning environment is 1 predictor of academic performance; however, the literature would benefit from investigation of the difference between SBHC users and nonusers on perceptions of the learning environment as well as other indicators of academic performance. Although ideal, a study of the relationship between SBHC and academic performance indicators such as attendance and grades is difficult due to the multiple extraneous factors that are also known to be associated with students' performance, such as parental guidance and peer influence.<sup>1</sup> Additional research may also investigate whether perceptions of the learning environment differ depending of school type (elementary, middle, high) as well as SBHC status.

### Limitations

This study is correlational rather than causal, so it cannot be stated that having a SBHC *caused* a better learning environment. Yet the evidence presented from this study suggests that there is a correlation between having a SBHC and the perception of a more optimal learning environment. This correlation may be due to uncontrolled differences in leadership or in the student body. However, the differences are most likely not due to differences in race/ethnicity, school size (enrollment), percentage of students receiving free lunch, perception of students receiving special education services, or in the number of students who are English-language learners because all of these demographic factors were controlled for in the propensity matching and sample selection process.

### Conclusion

In all, this study demonstrates some evidence of the positive effects that SBHCs may have on the schools within which they are housed. Perhaps by helping to eliminate the barriers that affect lower-performing students' readiness to learn SBHCs can partner with schools to reach their performance and accountability goals. In the future, SBHCs may help schools move toward what Randi Weingarten called the "community school," where students and their families are truly engaged with their schools and where all the services and activities they need can be found underneath 1 roof.

### IMPLICATIONS FOR SCHOOL HEALTH PRACTICE

As illustrated in Table 3, parents and students in SBHC schools consistently rate elements of the learning environment higher than parents in schools without centers, suggesting that SBHC staff seem to be effective at engaging and communicating with parents and students. This practice should continue; however, there were no differences in learning environment scores among teachers. This may be in part due to insufficient coordination between the teachers and the SBHC staff. The literature suggests that although schools house SBHCs, the 2 often "speak different languages."<sup>31(p338)</sup> The primary focus of schools and teachers is on attaining academic success, while the focus of SBHCs is on improving access to health care and positive health outcomes. Perhaps more collaboration needs to occur to link health outcomes with academic outcomes. For instance, school health liaisons can be provided by SBHCs to assist teachers with supplemental activities for their health curriculum, such as providing modules on improving attention through brief exercise games in the classroom. Other services might focus on variables to improve the overall learning environment such as psycho-educational groups offered by SBHC staff to decrease teacher stress and burnout.

### Human Subjects Approval Statement

This study was approved by the institutional review board of the Albert Einstein College of Medicine at Yeshiva University.

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