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School-Based Health Centers' Presence:

The Role of School and Community Factors

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Abstract

Introduction—School-based health centers (SBHCs) offer an efficient mechanism for delivering health services to large numbers of underserved youth; however, their availability varies across communities. Data on sociocontextual variables were analyzed to investigate factors that inhibit and facilitate SBHCs.

Methods—Secondary data from 2012 to 2015 state databases were linked to examine the association between SBHCs' presence in California high schools and demand, resource, and political conservatism at the school and community levels that may influence where SBHCs are located and the number of provided health services. Data were analyzed in 2015 using hierarchical binary and Poisson models.

Results—Presence of a local non-school-based family planning clinic was the strongest correlate of SBHC presence. School size, percentage non-white, and percentage receiving free or reduced-price lunches were positively associated with SBHC presence. Percentage who voted Republican in the 2012 general election and teen pregnancy rates were negatively associated with SBHC presence. None of the predictors were associated with number of services provided by SBHCs.

Conclusions—School and community factors appear to play a role in supporting or impeding the establishment of SBHCs. In addition to variables tapping communities' need for and resources available to support SBHCs, political conservatism appears to affect SBHC availability. SBHC advocates can use this information to understand where opportunities for growth might exist, identify collaborative partners, and prepare for challenges to supporting new SBHCs. Researchers may also use this information in evaluation studies to control for school-level confounders and develop appropriate comparison samples through matching procedures.

Introduction

School-based health centers (SBHCs) provide a mechanism for delivering diagnostic, preventive, and treatment services to youth whose healthcare needs are underserved by other

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providers. SBHCs aim to reduce barriers associated with accessing health services by providing reduced-cost or free services, having convenient hours, and eliminating transportation issues.¹ Adolescent access to/use of an SBHC has been associated with positive health outcomes, including having a medical home, receiving and completing an immunization series, declining birth rates, higher numbers of prenatal care visits and decreased likelihood of delivering low birth weight babies, and higher rates of contraceptive use.^{2–8}

Despite substantial growth in SBHCs across the U.S. from 150 in 1989 to 1,930 in 2011, their distribution is uneven.⁹ There may be community barriers that preclude SBHC presence, school resources that maintain SBHC presence, and student healthcare needs that support SBHC demand. Given the politically controversial nature of some SBHC services, particularly the provision of sexual and reproductive services, the process of instituting these clinics is often a complex task. This is the case especially when recommended services galvanize intense opposition from community groups based on moral traditionalism/family values grounds, extending culture wars to school services.^{10,11} Insights into facilitating and hindering influences are found in experiences of practitioners, qualitative work by researchers, and limited quantitative studies.

Using case studies of four SBHC sites and one site in which a clinic was defeated, qualitative work found that opposition most often came from national conservative organizations and their local chapters, which all reported sexuality issues as reason for their opposition.¹⁰ Planning for an SBHC required significant commitment from school and community leaders, whose primary functions were to increase public awareness and concern about the health issues and cultivate receptivity for the program, including preparing supporters for probable resistance. Policies to limit or eliminate family planning services were enacted in all four sites that established SBHCs, demonstrating that organized opposition can successfully affect outcomes in healthcare service provision.

To date, only four studies have empirically examined the sociocontextual determinants associated with the: (1) presence of SBHCs; (2) total number of provided services; and (3) types of offered services. These studies have examined multiple school-level and community correlates including those related to need (e.g., percentage of students without health insurance, poverty level), available or possible resources (e.g., percentage enrolled in Medicaid, local healthcare center), and potential barriers (e.g., community conservatism).^{12–15}

Using data from the first wave of the National Longitudinal Study of Adolescent Health (Add Health), one study found that the provision of a set of three services—mental health counseling, physical examinations, and substance abuse counseling—on a high school campus was positively associated with lack of health insurance and Medicaid enrollment and negatively associated with percentage minority, small school size, and location in the South.¹² Interestingly, different patterns emerged across the individual health services. Another study, using the same data set, likewise found varying patterns of association depending on the school health service in question.¹³ The provision of family planning counseling was positively associated with state policy, programs, and requirements;

community SES; and local resources for education and negatively associated with alternative sources of health care and private school. Conversely, substance abuse counseling was negatively associated with state policy, programs, and requirements and private school and positively associated with alternative sources of care, community SES, and local educational resources. These findings suggest a complex environment in which different school and community factors may exert their influence depending on the service in question.

Another study found that percentage minority elected officials, elected school board, and the existence of a state SBHC association were sociocontextual factors significantly and positively associated with the provision of general health services. Similarly, minority elected officials and percentage black population were significantly and positively associated with the provision of sexual health services. Moral traditionalism, as measured by the percent of evangelicals or fundamentalist Christians, was negatively associated with the provision of sexual health services.¹⁴ Again, depending on the health service, different factors appear to be significant. Nonetheless, school and community factors appear to be critical in supporting, or obstructing, the opening and maintenance of an SBHC.

Unfortunately, this research is several decades old (e.g., Add Health Wave 1 data were collected in 1994–1995) and with samples of fewer than 200 schools.^{13,14} As the demand, interest, and potential for SBHC funding increases, it is important to empirically revisit the issue of what factors in the school and community relate to SBHCs' implementation. Specifically, there is a need to ascertain whether factors associated with SBHCs' existence in the 1990s exist today or whether new issues have evolved that affect the adoption of SBHCs. This information can be invaluable to school administrators and health providers interested in implementation. Thus, a major focus of this study is to better understand the conditions that currently give rise to SBHCs and increase awareness of potential barriers. Moreover, as most SBHC research is quasi-experimental, it is necessary to identify what characteristics at the school and community level predict the presence or absence of SBHCs in order to identify appropriate matching schools, develop propensity matching scores, and control for relevant variables. Researchers must investigate potential covariates to ensure that SBHC effects are not overstated or understated. This study updates research on correlates of SBHC implementation by using current data to examine what factors are associated with: (1) the presence of an SBHC on a high school campus; and (2) the total number of services provided by an SBHC.

Methods

Study Sample

Publicly available data were downloaded from various California state organizations. All data were aggregated up to the school or school district level. A matching procedure using school name, school ID, or school address allowed for the linkage of various data sets.

Analyses were restricted to California public high schools that enrolled 100 students in Grades 9–12 and did not serve unique populations such as Regional Occupational Programs, and alternative, charter, and community day schools. In California, some high schools have been divided into smaller academies or small learning communities, each with its own

academic focus. However, because these smaller entities share the same geographic location and centralized school resources (e.g., SBHC, school library, cafeteria), their school-level demographics were aggregated and treated as one school. These criteria resulted in a final sample of 948 schools, 88 (9.2%) of which had onsite SBHCs.

Measures

A list of all California schools that have clinics was obtained in 2015 from the California School-Based Health Alliance website (www.schoolhealthcenters.org/school-health-centers-in-ca/locations/sbhcs-by-county/). This list includes mobile health vans, school-linked health centers, and onsite SBHCs that serve California elementary, middle, and high schools. For all high schools, a dichotomous variable (1=yes, 0=no) was created to indicate whether there is an onsite SBHC.

The California School-Based Health Alliance website also provides information about the types of services provided at each SBHC. Services listed include medical, mental health, any dental, any reproductive, health education, and nutrition/fitness. To measure the range of health services offered by each SBHC, an index score was created by summing across all services (range, 1–6).

Select variables reflecting unmet need for health services at the school and community levels were used. School-level demand variables came from the most recently available National Center for Education Statistics data set (2011–2012 school year) and included percentage of students receiving free or reduced-price lunches, percentage of non-white students, and indicators of urbanicity. Previous studies have used racial composition and neighborhood SES as a proxy for healthcare needs, with a higher percentage of minorities or lower SES indicative of greater unmet healthcare needs.¹² Similarly, a negative relationship has been found between the supply of general pediatricians and rurality, suggesting that demand may be higher and availability lower in rural areas.¹⁶ As such, the items listed above represent unmet need and therefore a proxy for demand. Relatedly, the variable total number of students was included as a demand variable as it represents a large number of potential patients.

Three variables were selected to examine local health needs: immunization rates, pregnancy rates, and asthma emergency department visits. The California Department of Public Health provides annual immunization levels in child care centers and schools in California. Data from the 2012–2013 school year were obtained on the percentage of youth immunized for tetanus, diphtheria, and pertussis (school level).

Teen birth data for 2011 were obtained from the California Department of Public Health and contained all live births in California by ZIP code of mother's residence. Asthma data were also obtained from the California Department of Public Health and included the number of children (aged 0–17 years) who had an asthma emergency department visit in 2012 by ZIP code. Because a school's ZIP code does not necessarily represent the ZIP codes of its students, estimates of teen births and asthma ER discharges at the school district level were constructed by reallocating ZIP codes that cross school district boundaries. This was accomplished by assigning all Census blocks within a district the birth and immunization

data of their best-matched ZIP code and then assigning the district the population-weighted average values of its nested Census blocks.

Community health partners often provide the necessary resources to support an SBHC. Data on the presence of non-school based publicly funded family planning clinics were obtained from The National Campaign to Prevent Teen and Unplanned Pregnancy Bedsider program for 2014. A majority of these clinics also provided additional primary care health services as they comprised community, health, and family clinics, as well as Planned Parenthood clinics. These clinics were mapped and a variable was created to indicate whether the school's estimated attendance zone contained a clinic. Each school's attendance zone was defined as the area within its school district closer to it than any other school. A dichotomous (1=yes, 0=no) variable was created to identify schools with a clinic in their catchment area.

Voting data were obtained from the California Statewide Database and included all registered voters sorted by voting precinct and political party in the 2012 general election. Again, because a school's ZIP code and voting precinct do not necessarily represent the ZIP codes and precincts of its students, estimates were constructed to represent the percentage of voters who voted Republican within a school district.

Statistical Analysis

The authors used SPSS, version 21_ to calculate descriptive statistics. The amount of missing data for the item free or reduced-price lunches was relatively high (23.6%). However, no differences emerged between schools with missing and non-missing data in terms of total number students, location (e.g., urban, suburban), median household income, or SBHC presence. Schools with missing data had on average a significantly higher percentage of non-white students (mean, 73.09) than schools without missing data (mean, 68.23). Missing values were replaced using expectation maximization in SPSS. This method was also used for the 11 schools that were missing data on the variables relating to immunization rates. Regression analyses were limited to non-SBHC schools ($n=860$) and SBHC schools that offered family planning services ($n=78$, 88.6%).

Data were analyzed using HLM 7. Specifically, a binary outcome hierarchical model (Bernoulli) was selected to assess school-level and district-level factors associated with the presence of an SBHC. A truncated Poisson model was used to examine the outcome, total services offered by SBHCs. To determine whether the analysis should include a spatial component, residuals of the latter analyses were mapped to schools and a Global Moran's I test statistic was calculated on the residuals. The Moran's I index was small and non-significant, indicating that the residuals were not spatially autocorrelated (Moran's Index, 0.006; $z=1.125$). Analyses were conducted in 2015.

Results

A greater percentage of SBHCs were located in cities (65.9%) and suburbs (23.9%) than in rural areas (6.8%) or towns (3.4%). Bivariate comparisons between schools with and without an SBHC found that schools with an SBHC had, on average, a higher percentage of students

who received free or reduced-price lunch and minority students. They were also more likely to have at least one family planning clinic in the area, fewer teen pregnancies within the school district, and a smaller percentage of registered Republicans within the school district (Table 1). Schools with an SBHC had higher vaccination rates and higher asthma emergency department hospitalization rates.

A majority of California's SBHCs provided some form of reproductive health service as well as medical care and mental health services. Fewer clinics provided health education and nutrition and fitness services. Only 15.9% provided any dental health services (Table 2).

Regression results indicated that several school-level characteristics were associated with having an SBHC on campus. The strongest predictor was having at least one non-school based family planning clinic/service within the school's estimated attendance zone. Additionally, school size, percentage minority, and percentage free and reduced-price lunch were all positively correlated with having an SBHC on campus (Table 3). At the district level, schools within a district reporting a higher percentage of registered Republicans had lower odds of having an SBHC, whereas schools within a district that reported lower levels of teen pregnancy were more likely to have an SBHC on campus. A truncated Poisson regression examined factors associated with the number of services available onsite and found no significant associations.

Discussion

The results suggest that resources, need, and political ideology are associated with SBHCs' presence in California. The strongest correlate of SBHC location was the presence of a non-school based family planning clinic in the school's designated neighborhood. This item is likely a proxy for a nearby general health or community clinic, hospital/medical center, or nonprofit community-based health organization that provides both primary care services and family planning services. Thus, the noted relationship is not surprising, as community health partners often provide the necessary resources (e.g., funding, staff, equipment) to support an SBHC. In fact, a number of SBHCs in California are sponsored or administrated by a local community health clinic. These findings suggest that schools wishing to establish an SBHC may benefit from building a strong relationship with a local community health clinic to marshal resources needed to meet the needs of youth in their neighborhoods and schools.

Several demand- or need-based characteristics were also predictive of an SBHC. The presence of SBHCs in schools with greater needs as measured by size, minority status, and percentage free and reduced-price lunches suggests that SBHCs are located in areas where there may be higher levels of poverty, lower levels of health insurance, and a large number of patients, resulting in high demand levels. Such findings are consistent with the mission of SBHCs—to address youth who are underserved with regard to health services. However, given the cross-sectional nature of the data, the direction of the effect is unclear. The moderately significant association between teen pregnancy and SBHCs and non-significant differences in immunization and asthma rates could suggest that either SBHCs are not located in areas with high health needs or the health needs have been met as a result of the SBHC. Additional research using longitudinal data will be able to better answer these

questions and also address the long-term impact of SBHCs by examining changes in community health outcomes over time as a function of when clinics opened.

Lastly, political ideology appears to be related to the availability of healthcare services for youth. SBHCs are health organizations with the mission to provide easily accessible and affordable health care to youth and in theory should be exempt from politics. There are, however, many explanations for this finding, including SBHCs' rules that might exist around parental notification and the overwhelming number of SBHCs that provide reproductive health services—issues that tend to line up along party lines.

The fact that none of the school- and community-level factors were associated with the number of provided services is informative. This outcome may likely be driven by other factors such as specific health needs or the availability of space or funds, variables for which measures were not accessible (e.g., data on student mental health needs, which may be an important predictor of providing these services). Future research should examine these questions.

Limitations

The current study is not without limitations. The analyses are cross-sectional and thus directionality is unclear. Potential confounds include school-level finances/resources and other community health issues that were not measured in this study. Future research using longitudinal data is needed to understand which variables drive decisions regarding establishing an SBHC. Second, analyses were limited to larger, traditional high schools. Smaller, alternative schools may have different forces shaping whether a school has an SBHC. Third, although data were used on the full population of public high schools in a large, diverse state, such analyses using national data are needed to understand whether states are unique from one another or if there are national trends. Some variables such as the existence of a state-level SBHC association or state requirements for policies and programs may attenuate the effects of local contextual variables. Replication studies may help determine how local contextual factors drive decisions about SBHCs and what state policies and resources can best assist schools implementing onsite health services. However, inherent difficulties associated with this effort include resolving geographies, significant data collection, and estimate construction.

Conclusions

The current study has several implications for research on SBHCs and adolescent health outcomes. From a methodologic perspective, it is important for evaluation studies using quasi-experimental designs to ensure that school-level confounders are adjusted, either through statistical control or through the use of propensity score matching. The current study is particularly useful in that it suggests key variables that schools should be matched on or selected for when conducting SBHC research.

To reduce youth health disparities, it is important to understand how the local landscape may impact the provision of health services designed to support positive health outcomes. The current study notes that sociocontextual factors including need, resource, and political

conservatism may impact the presence of SBHCs. SBHC advocates (e.g., school administrators, local community agencies) can use this information to understand where opportunities for growth might exist, identify collaborative partners, and recognize challenges to supporting new SBHCs. Particularly, it is important to reach out to local community health centers or HMOs to assess their willingness to partner with a school to marshal resources. Equally important is to understand community concerns around SBHC issues (e.g., privacy, sensitive topics, parental notification) that may derail efforts to build or expand an SBHC.

As noted by the National School Based Health Alliance, strong partnerships between schools and community stakeholders support SBHC sustainability. These results echo this recommendation. To that end, establishing a new SBHC requires (1) bi-directional outreach and education between health organizations and school administrators and staff; and (2) a marshalling of knowledge (e.g., community norms, key stakeholders, advocates) and resources. Tools, strategies, and resources to support SBHC implementation and sustainability can be found in a recent publication by the American Public Health Association and on the National School Based Health Alliance website.

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Table 1

School- and District-level Characteristics, by School-based Health Center (SBHC) Presence

Characteristics	No SBHC (n=860) %, Mean (SD)	SBHC (n=88) %, Mean (SD)
School-level		
% of students on free lunch	23.4 (20.48)	33.24 (22.41)
% students non-white	67.40 (24.53)	88.57 (17.31)
High school size	1752.57 (860.72)	1807.30 (818.54)
% completed tetanus, diphtheria, and pertussis vaccine	97.79 (2.80)	98.80 (3.68)
Non-school-based family planning clinic	70.6%	90.9%
District-level		
Asthma ER visits per 10,000	66.60 (37.43)	81.54 (31.49)
% of school district registered voters registered as Republican in 2012 general election	32.45 (11.16)	17.98 (9.23)
% of live births by teen mother in 2012	7.48 (3.70)	7.18(3.21)

Note: Boldface indicates statistical significance ($p < 0.01$).

Table 2

School-based Health Center Services, n=88

Type of service	%, Mean (SD)
Any reproductive health services	88.6%
Medical	83.9%
Mental health	75.9%
Health education	64.4%
Nutrition and fitness	37.9%
Any dental health services	15.9%
Total number of services	3.68 (1.12)

Table 3

School- and District-Level Characteristics Associated with Presence of School-based Health Center (SBHC),
Two-Level Binomial Model

	OR	95% CI
<u>School-level</u>		
Rural	1.453718	(0.644,3.284)
Town	0.567691	(0.161,1.996)
Suburb	0.661105	(0.367,1.190)
High school size, per 100	1.000301 **	(1.000,1.001)
% of students on free lunch	1.014033 ***	(1.000,1.029)
% students non-white	1.029308 ***	(1.008,1.051)
% completed tetanus, diphtheria, and pertussis vaccine	0.948533	(0.860,1.046)
Non-school-based family planning clinic	2.684236 ***	(1.324, 5.442)
<u>District-level</u>		
% of school district registered voters registered as Republican in 2012 general election	0.894554 ***	(0.868,0.922)
% of live births by teen mother in 2012	0.885298 *	(0.780,1.005)
Asthma ER visits per 10,000	1.000977	(0.990,1.012)

Model fit: $\chi^2 = 188.399(11)$, $p < 0.01$, ICC=0.355

Note: Boldface indicates statistical significance

 $p < 0.01$;

**
 $p < 0.05$;

*
 $p < 0.10$