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Characteristics Associated With School Health Services for the Management of Chronic Health Conditions

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Abstract

It is unknown how health services staff (school nurse or school physician) or school characteristics are associated with the number of services provided for chronic health conditions in schools. Using data from the 2014 School Health Policies and Practices Study, four services (identification or school-based management, tracking, case management, and referrals) were analyzed using a multivariable ordered logistic regression. Approximately 57.2% of schools provided all four, 17.5% provided three, 10.1% provided two, 5.8% provided one, and 9.4% did not provide any such services. Schools with a school nurse were 51.5% ($p < .001$) more likely to provide all four, and schools with access to consult with a school physician were 15.4% ($p < .05$) more likely, compared to schools without one. Schools comprised of mostly racial/ethnic minority students (less than or equal to 50% non-Hispanic White) were 14.7% ($p < .05$) less likely to provide all four, compared to schools with greater than 50% White students.

Keywords

school nurses; school physicians; school health services for students with chronic health conditions

In the United States, chronic health conditions may affect up to 25% of children and adolescents (Health Resources and Services Administration, 2017; Leroy, Wallin, & Lee,

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Authors' Notes

The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention, the Department of Health and Human Services, or the United States government.

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2017). Some chronic health conditions such as asthma, diabetes, and seizure disorders can affect students during the school day and possibly impact their academic performance (Centers for Disease Control and Prevention [CDC], 2017). For example, research has shown that 49% of students with asthma miss one or more days of school because of their asthma symptoms (CDC, 2015a). Students with diabetes often face many challenges in school with monitoring and treating blood glucose levels, which can ultimately impact quality of life (Pansier & Schulz, 2015) and school achievement (Wodrich, Hasan, & Parent, 2011). Research illustrates that students with seizure disorders may have difficulty with cognitive ability, academic performance, and scores on intelligence tests (CDC, 2017).

School health services can help students manage chronic health conditions while at school. Health services staff, namely school nurses and school physicians, play crucial roles in the provision of services. Although school nurses may be thought of as the primary provider of these services, the school physician also plays an important role in the provision of health services for chronic health conditions.

School health services began in the early 1900s with school physicians providing care and treatment (Schumacher, 2002). The role has changed over time, and currently, school physicians often provide consultation to a district, while some focus their attention on the needs of individual school-aged children (American Academy of Pediatrics [AAP] Council on School Health, 2019). School physicians collaborate with school nurses (AAP Council on School Health, 2016b) and manage chronic and acute illnesses, aid with accommodations for students with special health-care needs, and oversee education, health promotion, environmental health and safety, and emergency responses (Devore, Wheeler, & AAP Council on School Health, 2013). Due to the consultative nature of many school physicians, the number of school physicians in the workforce is unclear.

The school nurse continues to focus on the health and academic needs of students. They provide both emergency and routine health-care management for students and coordinates care with a student’s family and health-care providers to keep the student healthy and safe (McClanahan & Weismuller, 2015). They also provide population-based interventions to promote health and identify students at risk.

To date, there are approximately 95,800 full-time equivalents of school nurses among U.S. public and private schools (Willgerodt, Brock, & Maughan, 2018). Geographic differences in distribution and their workloads may impact service provision. For instance, school nurses in the Western United States tend to cover more than one school building (Willgerodt et al., 2018), while schools in rural areas might face staffing challenges—the likelihood of having a full-time school nurse on-site is lower compared to urban areas, and school nurses must often travel large distances between buildings (Jameson, Engelke, Anderson, Endsley, & Maughan, 2018).

Some students may need more intensive services, which can affect the number of students who are evaluated or treated during the school day. Other demographics, such as free or reduced-price lunch eligibility and English language proficiency of students, may also affect

the workload of school nurses (Jameson et al., 2018) and ultimately the type and number of services provided.

School health services to support students with chronic health conditions can include identification or school-based management, tracking, case management, and referrals. However, variation exists in the number of school health services provided in school, and it is unknown how health services staffing or school characteristics are associated with service provision. Therefore, our study aims to (1) describe health services staffing and school-based characteristics that are associated with the on-site provision of identification or school-based management, tracking, case management, and referrals for students with chronic health conditions and (2) determine how health services staffing and school-based characteristics are associated with the number of services provided at school to students with chronic health conditions. Gaining an understanding of the characteristics that are associated with service provision among the school nurse and school physician workforce could inform school district and school-level health policies and practices.

Method

Data Source

This study analyzed school-level data from the 2014 School Health Policies and Practices Study (SHPPS). SHPPS is a national survey conducted by the CDC to assess policies and practices at the state, district, school, and classroom levels across 10 components of school health. This study used the most current school-level data from the Health Services component of SHPPS, which was collected between February and June 2014 via computer-assisted personal interviews with the school staff member who was responsible for or most knowledgeable about health services at the school. In 67.6% of participating schools, the respondent was a school nurse. SHPPS was reviewed by an institutional review board at CDC and was determined to be exempt under Federal Regulation 45 CFR 46.101(b).

The SHPPS data file includes information about select school characteristics sourced from the National Center for Education Statistics (NCES), such as geographic region and metropolitan status. Other variables were obtained from extant data collected by Market Data Retrieval and linked to the SHPPS data set. These included percentage of non-Hispanic White students and percentage of students eligible for free or reduced-price lunch. The percentage of students eligible for free or reduced-price lunch was categorized into three groups: <40%, ≥40% to <75%, and ≥75%. The 40% cutoff was chosen to align with the school-level threshold for the Community Eligibility Provision (U.S. Department of Agriculture Food and Nutrition Service, 2019). The NCES uses ≥75% eligibility to identify high poverty schools (NCES, 2015).

Study Population

A detailed description of SHPPS methods has been published previously (CDC, 2015b). Briefly, SHPPS used a two-stage sample design to select a nationally representative sample of elementary, middle, and high schools. All public and private schools in the United States

with any of grades kindergarten through 12 were eligible for sampling. Of 828 eligible schools, 588 (71%) completed the Health Services interview.

Outcome Measures

The following services for chronic health conditions were investigated: (1) identification or school-based management of students with chronic health conditions, (2) tracking students over time, (3) case management, and (4) referrals to community-based care. Respondents were asked, “Does your school provide … ” each of a list of services. Table 1 displays the description of the school health services from the 2014 SHPPS Health Services questionnaire included in this analysis. Tracking was defined on the questionnaire as “keeping track of such things as symptoms at school, non-participation in physical education or activities, and absences due to chronic conditions” (CDC, 2015c). Case management was defined as “wide-ranging assistance such as helping the student access needed services, providing counseling and anticipatory guidance, briefing the student’s family members about necessary care, and helping the student learn and implement self-management of his or her condition or disability” (CDC, 2015c). Identification or school-based management and referrals were not further defined on the questionnaire.

Control Variables

As defined on the SHPPS Health Services questionnaire, access to consult with a school physician was assessed by asking, “Is there a school physician who can be called to consult as needed during the school day?” (CDC, 2015c). Response options were either “yes” or “no.” Based on previous research demonstrating the importance of health services staff in providing services to students for chronic health conditions (Leroy et al., 2017), variables related to access to consult with a school physician and the presence of a school nurse were included as control variables. A school nurse can be any registered nurse (RN) or licensed practical nurse (LPN), “whether employed by the school, district, health department, or any other employer, who provides any standard health services to students at [the] school” (CDC, 2015c). Response options were either “yes” or “no.”

The school-based characteristics examined in this study were chosen based on a previously published study (Michael, Brener, Lee, Clennin, & Pate, 2019). Dichotomous variables included school type (public vs. nonpublic) and percentage of non-Hispanic White students enrolled. Percentage of non-Hispanic White students were categorized into ≤50% and >50%. Other categorical variables included school level (elementary, middle, and high school), percentage of students eligible for free or reduced-price lunch (proxy for income; see Data Source above for categories), geographic region (Northeast, Midwest, West, and South), and metropolitan status (urban, rural, town, and suburban).

Statistical Analysis

Analysis was conducted with Stata Version 14 (College Station, TX) and accounted for the complex survey design. Data were weighted to provide national estimates. Bivariate analyses between each individual service type and health services staffing and school characteristic were conducted to assess associations with Pearson’s χ^2 tests. Pairwise t tests were conducted to assess significant differences between each category of the variables.

An ordinal variable was created reflecting the total number of services (i.e., 0, 1, 2, 3, or 4) provided for students with chronic health conditions in each school. A multivariable ordered logistic regression was conducted to assess relationships between the number of services and health services staffing and school characteristics. Conditional marginal effects evaluated at the mean for the outcome of all four services are reported. Reference categories were based on a previously published study (Michael et al., 2019). p values < .05 were considered statistically significant. Model specification tests as well as testing the proportional odds assumption (POA) and tests for multicollinearity were performed. The model did not violate the POA, and inspection of variance inflation factors revealed that none of the covariates posed any problems with collinearity and all covariates were kept in the model.

Results

Nationwide, 82.7% of schools provided identification or school-based management of chronic health conditions, 81.0% provided tracking, 73.6% provided case management, and 68.6% provided referrals. The majority of schools (82.0%) had a school nurse who provides standard health services, while 35.7% of schools had access to consult with a school physician. School demographic characteristics are displayed in Table 2. More than half (57.2%) of schools provided all four services to students with chronic health conditions, 17.5% provided three services, 10.1% provided two, and 5.8% provided one service. Almost a tenth (9.4%) of schools did not provide any health services for students with chronic health conditions.

Bivariate associations and comparison tests are illustrated in Table 3. Having a school nurse was significantly associated with providing any of the four services ($p < .001$). Access to consult with a school physician was significantly associated with providing any of the four services ($p < .01$). Geographic region and metropolitan status were significantly associated with identification or school-based management, tracking, and case management, and geographic region was associated with referrals. Elementary schools were significantly more likely than middle schools to provide identification or school-based management of chronic health conditions ($p < .01$). Compared to nonpublic schools, public schools were more likely to provide each of the four services ($p < .001$).

Overall, schools in the Northeast (all $p < .05$ or less) were more likely to provide all four services compared to schools located in the Midwest, West, or South. Differences among schools based on metropolitan status were apparent as well. Schools in urban areas were less likely to provide (1) identification or school-based management ($p < .01$) and tracking ($p < .05$) compared to schools located in towns, (2) identification or school-based management ($p < .05$) and referrals ($p < .05$) compared to schools in rural areas, and (3) identification or school-based management compared to schools in suburban areas ($p < .05$). Schools located in towns were more likely to provide case management compared to schools in rural ($p < .05$), suburban ($p < .05$), and urban areas ($p < .01$).

Results from the ordered logistic regression are illustrated in Table 4. Schools with a school nurse were 51.5% ($p < .001$) more likely to provide all four services, compared to schools without one. Schools with access to consult with a school physician during the school day

were 15.4% ($p < .05$) more likely to provide all four services, compared to schools without one. Schools with less than or equal to 50% non-Hispanic White students were 14.7% ($p < .05$) less likely than schools with greater than 50% of such students to provide all four services.

Discussion

School nurses and school physicians have played key roles in providing health services to students for decades. This study reveals that the presence of a school nurse or access to consult with a school physician are significantly associated with each of the four service types and an increase in the number of services provided.

Elementary schools had a greater tendency to provide identification or school-based management of chronic health conditions compared to middle schools. Students in elementary school may be new to school or may need more attention due to their developmental stage, often requiring more adult involvement. Some examples include assistance with medication administration, compliance, or health education about asthma, epilepsy and seizure disorders, diabetes, or food allergies—areas where school physicians and nurses play essential roles. In 2014, more elementary schools had a school physician or school nurse than middle/high schools (CDC, 2015b).

Public schools were also more likely to provide each of the four services. This may be because 82% of public schools employ either a part-time or full-time nurse. State or local mandates may require employment of a school nurse in order to receive funding, whereas employment may be discretionary for private schools. Health-care disparities may also be a contributing factor, as students in private schools may be more likely to have private health insurance and access to specialty care for their chronic health conditions, compared to students in public schools.

Our study reveals that schools comprised of mostly racial/ethnic minority students are less likely to provide all four services, compared to schools with a majority of non-Hispanic White students. Assumptions would indicate that schools with higher rates of minority groups may have a higher need of services based on data that indicate many disparities of health exist among minority groups when compared to White Caucasians. Health disparities are apparent among racial/ethnic minority children and adolescents (Flores, Hollenbach, & Hogan, 2019), but increased school health services may have the potential to reduce these health disparities. For example, from 2001 to 2016, children of Black or Puerto Rican descent had higher prevalence of asthma compared to non-Hispanic White children, and asthma prevalence increased among Mexican/Mexican American children (Zahran, Bailey, Damon, Garbe, & Breysse, 2018). Hispanic adolescents and young adults experience a myriad of health disparities that include higher rates of obesity and worse mental health outcomes than their White peers (Kann et al., 2016). Yet results indicate the provision of fewer services. Further investigation to understand this phenomenon is needed.

Schools in the Northeast are more likely than schools in other regions of the United States to provide all four services. Similarly, Northeastern schools were more likely to have a

full-time school nurse working alone and to have a higher likelihood of nurses who work in only one building, versus splitting time between two or more school buildings (Willgerodt et al., 2018).

The AAP recommends the presence of a qualified school nurse and a school physician in every school district, as this team-based care nurtures the codependent relationship between health and academic achievement, including better graduation rates and improved attendance (AAP Council on School Health, 2016a). To date, no single national set of school health services laws exists. School health services are regulated by state or local government or individual school districts, and wide variations exist (Brener, Wheeler, Wolfe, Vernon-Smiley, & Caldart-Olson, 2007; CDC, 2008). The presence of a school nurse is subject to state laws and policies as well as state school nurse practice acts. Each state has laws and regulations concerning education and licensing requirements for physicians, RNs, and LPNs/licensed vocational nurses as well as the scope of practice for each type of nurse. Similarly, some schools have regulations concerning access to a school physician set forth, but the majority of schools do not mandate this (Devore et al., 2013). Whereas the Joint Commission provides some guidance related to hospital medicine and nursing accreditation standards, school health has no equivalent (The Joint Commission, 2019).

School physicians play significant roles in influencing school health services and in supporting students with safe policies and procedures. When working collaboratively with a school nurse, safe, effective, patient-centered, and equitable care can be achieved (AAP Council on School Health, 2016a). To our knowledge, this is the first study to show an association with the presence of a school nurse or access to consult with a school physician in the number of services provided to students with chronic health conditions.

Health services staff in schools may also curb costs. Schools are often funded by states based on student attendance; a school physician and/or school nurse could save money by lowering rates of absenteeism through education and advocacy, resulting in better disease management (Moricca et al., 2013; Wheeler, Buckley, Gerald, Merkle, & Morrison, 2009). In Massachusetts, through the Essential School Health Services program, school health services delivered by full-time RNs prevented an estimated $20.0 million in costs due to medical care, $129.1 million in costs due to teachers' productivity loss, and $28.1 million in costs due to parents' productivity loss (Wang et al., 2014).

The National Association of School Nurses recommends that all students have access to a registered school nurse all day, every day. Based on our study, although the majority of schools have a school nurse, almost 20% still do not employ any type of school nurse (either part-time or full-time), and only 35.7% of schools have access to a consulting physician. Almost 10% of schools do not provide any of the school health services examined in this study. By failing to provide such services, many schools may be missing out on the multitude of benefits to student health.

The complexity of financing school nurses and school physicians must be addressed, as this contributes to why many schools may not employ them. To date, the majority of school nurses (90%) are still funded through education dollars, and 82% are employed

through education systems (Mangena & Maughan, 2015). Literature is scant on how school physicians or other health-care providers are funded, but following the model of other school health services, funding tends to come from education dollars. However, budget constraints among education systems and the search for new ways to provide a school nurse or a consulting health-care provider have produced differing funding and staffing models. This includes funding from a multitude of sources, such as health-care systems, public health, and other options (Mangena & Maughan, 2015). Private schools are funded and regulated differently than public schools, and decisions are left more to the governing body of the private school.

This study has limitations. It is cross-sectional, and a cause–effect relationship could not be established. A longitudinal study could provide additional insight on patterns and trends over time. Interpretations of the definitions of case management or referrals could have affected survey responses, as understanding of these services could differ between survey respondents. Self-reported data are prone to response or recall bias. School-based health centers were not included as a control variable due to low prevalence in our study sample.

Future studies should examine all personnel working in the school setting, including advanced practice nurses and physician assistants who address chronic health conditions, and an understanding of case management definitions and referrals between nursing and medical providers, especially as it relates to school health. The impact of a school nurse's education level or years of experience on service provision should also be explored. More research is needed to understand regional variations in service provision. Home and family factors, such as home languages other than English and poverty (Maughan, 2016), as well as immigration status, should be explored. Research that encompasses the collective impact of the social determinants of health is necessary, and understanding the broad landscape of the school environment is needed to ensure that students have access to necessary services to manage chronic health conditions and to assist students with achieving optimal academic performance (Lewallen, Hunt, Potts-Datema, Zaza, & Giles, 2015; Michael, Merlo, Basch, Wentzel, & Wechsler, 2015).

Implications for School Nursing Practice and School Health Policy

The results of this study provide evidence of a relationship between the presence of a school nurse or access to consult with a school physician and the number of services provided to students with chronic health conditions. Given the importance of school nurses and school physicians in health service provision, school district administrators and policy makers could consider prioritizing staffing and funding for these critical roles. This may be especially important for schools located in underserved communities, most specifically in schools comprised of a majority of racial/ethnic minority students. Results suggest that service provision tends to be lower in schools comprised of a majority of such students. Finding alternative funding sources and looking at state and local policies that would facilitate school nurses in the school to address chronic health conditions would be helpful to increase the number of services for students with chronic health conditions.

Conclusion

Our study provides novel evidence that supports the pivotal roles of both the school nurse and school physician work-force in the provision of services to students with chronic health conditions. Adequate access to school health services is beneficial to the overall health and academic performance of students living with chronic health conditions, particularly those who attend schools in underserved communities. Districts and schools should consider ways to optimize student success by increasing access to school nurses and school physicians.

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Table 1.

Description of the four main services for students with chronic health conditions from the School Health Policies and Practices Study Questionnaire—United States, 2014.

Short-Hand Title for Chronic Health Service	Description
Identification or school-based management	Identification or school-based management of chronic health conditions, such as asthma or diabetes.
Tracking	Keeping track of symptoms at school, nonparticipation in physical education or activities, and absences due to chronic conditions.
Case management	Wide-ranging assistance such as helping the student access needed services, providing counseling and anticipatory guidance, briefing the student's family members about necessary care, and helping the student learn and implement self-management of his or her condition or disability
Referrals	Referrals for chronic health conditions such as asthma or diabetes.

Table 2.

Percentage of Schools With Each Service or Characteristic—United States, 2014.

Service/Characteristic	Total % (95% CI)[a]
Health services offered	
Identification or school-based management	82.7 [77.9, 86.7]
Tracking	81.0 [76.2, 84.9]
Case management	73.6 [68.3, 78.3]
Referrals	68.6 [63.2, 73.6]
Number of services provided	
0	9.4 [6.6, 13.1]
1	5.8 [3.9, 8.5]
2	10.1 [7.7, 13.2]
3	17.5 [13.6, 22.2]
4	57.2 [51.0, 63.2]
School nurse who provides standard health services	82.0 [76.7, 86.3]
School physician who can be called to consult as needed during the school day	35.7 [29.5, 42.5]
School level	
Elementary	52.0 [49.1, 54.9]
Middle	27.4 [25.0, 29.9]
High[b]	20.6 [18.2, 23.3]
School type	
Nonpublic	27.6 [22.0, 33.9]
Public[b]	72.4 [66.1, 78.0]
Non-Hispanic White students	
≤ 50%	37.4 [30.1, 45.4]
>50%[b]	62.6 [54.6, 69.9]
Students eligible for free or reduced-priced lunch	
<40%	38.6 [32.0, 45.6]
≥ 40% to <75%	39.5 [32.8, 46.5]
≥ 75%[b]	22.0 [16.4, 28.7]
Geographic region	
South	31.5 [23.8, 40.4]
Midwest	25.6 [18.7, 33.9]
West	24.5 [17.7, 33.0]
Northeast[b]	18.3 [12.5,26.2]
Metropolitan status[c]	
Suburban	29.3 [25.0, 33.9]
Town	12.6 [9.6, 16.5]
Urban	31.9 [27.8, 36.2]
Rural[b]	26.2 [22.2, 30.7]

Note. CI = confidence interval.

[a]Frequency estimates are weighted.

[b]Reference group for ordered logistic regression.

[c]Determined by a Market Data Retrieval formula based on National Center for Education Statistics locale code classification and ZIP code.

Table 3.

Percentage of Schools Providing Services for Students With Chronic Health Conditions by Health Services Staff or School Characteristic: Tests of Associations and Comparison Tests.

Characteristic	Services for Students With Chronic Health Conditions[a]			
	Identification or School-Based Management, % (95% CI)	Tracking, % (95% CI)	Case Management, % (95% CI)	Referrals, % (95% CI)
Sample size, *n*[b]	563	565	566	563
Total percentage[c]	82.7 [77.9, 86.7]	81.0 [76.2, 84.9]	73.6 [68.3, 78.3]	68.6 [63.2, 73.6]
School nurse who provides standard health services	92.4 [89.0, 94.8]	89.1 [84.5, 92.5]	85.7 [81.0, 89.5]	81.0 [76.2, 85.0]
p Value	<.001	<.001	<.001	<.001
School physician who can be called to consult as needed during the school day	92.8 [87.9, 95.8]	88.8 [81.2, 93.6]	83.7 [75.8, 89.4]	81.8 [74.0, 87.7]
p Value	<.001	.009	.002	<.001
School level				
Elementary	86.7 [80.1, 91.4][d]	83.2 [76.4, 88.3]	73.2 [65.8, 79.5]	67.7 [60.2, 74.4]
Middle	76.9 [70.1, 82.6]	76.6 [68.8, 83.0]	71.6 [63.5, 78.5]	66.3 [58.2, 73.6]
High	80.3 [71.3, 87.0]	81.1 [72.1, 87.8]	77.3 [68.5, 84.3]	74.2 [66.4, 80.7]
p Value	.031	.304	.575	.302
School type				
Nonpublic	67.9 [55.6, 78.1]	64.1 [52.0, 74.7]	52.7 [40.2, 64.9]	46.3 [34.2, 58.8]
Public[e]	88.1 [84.1, 91.2]	87.0 [82.6, 90.5]	81.1 [75.8, 85.4]	76.6 [71.2, 81.3]
p Value	<.001	<.001	<.001	<.001
Non-Hispanic White students				
≤ 50%	84.5 [76.5, 90.1]	85.2 [76.4, 91.1]	79.1 [68.2, 87.0]	72.1 [61.3, 80.9]
>50%	91.5 [86.6, 94.7]	90.5 [85.4, 93.9]	83.4 [77.2, 88.2]	79.7 [74.2, 84.3]
p Value	.053	.190	.417	.127
Students eligible for free or reduced-priced lunch				
<40%	89.4 [82.4, 93.8]	88.3 [80.7, 93.1]	83.8 [75.3, 89.8]	78.3 [69.5, 85.1]
≥ 40% to <75%	89.8 [83.1, 94.1]	90.3 [84.2, 94.2]	79.6 [71.3, 85.9]	75.6 [66.1, 83.1]
≥ 75%	92.6 [81.2, 97.3]	85.5 [71.2, 93.3]	82.9 [68.5, 91.6]	78.5 [67.6, 86.4]
p Value	.782	.656	.716	.854

Characteristic	Services for Students With Chronic Health Conditions[a]			
	Identification or School-Based Management, % (95% CI)	Tracking, % (95% CI)	Case Management, % (95% CI)	Referrals, % (95% CI)
Geographic region				
South (S)	84.7 [76.1, 90.6]	82.7 [75.7, 87.9]	74.8 [66.6, 81.5]	70.9 [61.4, 78.8]
Midwest (MW)	78.4 [67.1, 86.6]	74.3 [64.0, 82.5]	67.6 [55.7, 77.5]	63.5 [52.3, 73.4]
West (W)	74.3 [63.2, 82.9]	73.7 [61.5, 83.1]	67.1 [55.5, 77.0]	59.5 [47.8, 70.2]
Northeast (NE)	96.4 [90.5, 98.7][f]	96.8 [90.5, 98.9][g]	88.5 [75.3, 95.1][h]	83.6 [73.5, 90.4][i]
p Value	.004	.001	.030	.013
Metropolitan status				
Suburban	85.0 [77.3, 90.3]	88.5 [78.4, 94.2]	76.4 [66.1, 84.3]	72.9 [62.2, 81.5]
Town	92.2 [81.3, 97.0]	90.1 [77.1, 96.1]	90.0 [78.9, 95.6][l]	73.0 [58.5, 83.8]
Urban	75.3 [64.5, 83.6][j]	73.0 [62.0, 81.8][k]	68.0 [55.7, 78.3]	61.6 [51.2, 71.1][m]
Rural	86.8 [79.0, 92.0]	81.0 [73.0, 87.0]	78.3 [70.8, 84.2]	76.3 [67.8, 83.1]
p Value	.024	.026	.038	.110

Note. CI = confidence interval.

[a] Questions on services for students with chronic health conditions originate from the 2014 School Health Policies and Practices Study Health Services Questionnaire.

[b] Number of observations of schools that provided each service.

[c] Total weighted percentage of schools that implemented each service.

[d] Significant *t* test between elementary versus middle schools ($p < .01$).

[e] Significant *t* tests between public and nonpublic schools for all four service types ($p < .001$).

[f] Significant *t* tests between the NE versus MW ($p < .001$), NE versus S ($p < .01$), and NE versus W ($p < .001$).

[g] Significant *t* tests between the NE versus MW ($p < .001$), NE versus S ($p < .001$), and NE versus W ($p < .001$).

[h] Significant *t* tests between the NE versus MW ($p < .01$), NE versus S ($p < .05$), and NE versus W ($p < .01$).

[i] Significant *t* tests between the NE versus MW ($p < .01$), NE versus S ($p < .05$), and NE versus W ($p < .001$).

[j] Significant *t* tests between urban versus rural ($p < .05$) and between urban versus towns ($p < .01$).

[k] Significant *t* tests between urban versus suburban ($p < .05$) and urban versus towns ($p < .05$).

[l] Significant *t* tests between towns versus rural ($p < .05$), towns versus suburban ($p < .05$), and towns versus urban ($p < .01$).

[m] Significant *t* test between urban versus rural areas ($p < .05$).

Table 4.

Ordered Logistic Regression for the Number of Services for Students With Chronic Health Conditions by Health Services Staff or School Characteristics.

Characteristic	β	*SE*	*ME*	*SE*
School nurse who provides standard health services				
Yes	2.339**	0.492	.515**	.076
School physician who can be called to consult as needed during the school day				
Yes	0.711*	0.331	.154*	.066
School level				
Elementary	−0.207	0.293	−.046	.064
Middle	−0.259	0.278	−.057	.061
School type				
Nonpublic	−1.233	1.243	−.299	.287
Non-Hispanic White students				
≤ 50%	−0.642*	0.319	−.147*	.075
Students eligible for free or reduced-priced lunch				
<40	−0.302	0.458	−.067	.987
≥ 40 to <75	−0.196	0.452	−.042	.096
Geographic region				
South	−0.025	0.558	−.005	.121
Midwest	−0.313	0.577	−.071	.128
West	−0.120	0.596	−.027	.131
Metropolitan status				
Suburban	0.130	0.373	.031	.088
Town	0.582	0.422	.128	.088
Urban	0.482	0.377	.108	.082

Note. N = 389 schools. F-statistic $p < .001$. β = beta coefficient; *SE* = standard error; ME = marginal effect.

*$p < .05$.

**$p < .001$.