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Long-term Health Implications of School Quality

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Abstract

Objective—Individual academic achievement is a well-known predictor of adult health, and addressing education inequities may be critical to reducing health disparities. Disparities in school quality are well documented. However, we lack nationally representative studies evaluating the impact of school quality on adult health. We aim to determine whether high school quality predicts adult health outcomes after controlling for baseline health, socio-demographics and individual academic achievement.

Methods—We analyzed data from 7,037 adolescents who attended one of 77 high schools in the United States and were followed into adulthood from the National Longitudinal Study of

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Adolescent to Adult Health. Selected school-level quality measures—average daily attendance, school promotion rate, parental involvement, and teacher experience—were validated based on ability to predict high school graduation and college attendance. Individual adult health outcomes included self-rated health, diagnosis of depression, and having a measured BMI in the obese range.

Results—Logistic regressions controlling for socio-demographics, baseline health, health insurance, and individual academic performance demonstrated that school quality significantly predicted all health outcomes. As hypothesized, attending a school with lower average daily attendance predicted lower self-rated health (Adjusted Odds Ratio (AOR) 1.59, $p=0.003$) and higher odds of depression diagnosis (AOR 1.35, $p=0.03$); and attending a school with higher parent involvement predicted lower odds of obesity (AOR 0.69, $p=0.001$). However, attending a school with higher promotion rate also predicted lower self-rated health (AOR 1.20, $p < 0.001$).

Conclusions—High school quality may be an important, but complex, social determinant of health. These findings highlight the potential inter-dependence of education and health policy.

Keywords

School quality; health; depression; obesity

Introduction

Educational attainment is a powerful predictor of lifelong health.^{1,2} More years of education are associated with longer life expectancy and lower rates of depression and obesity.³⁻⁵ While the causal pathway linking education and health has not been established, studies suggest several mechanisms such as improved health literacy, higher income, more work-related benefits, healthier social networks, and improved social standing.^{3,6-8} Given this evidence, addressing inequities in education may be critical to reducing health disparities.⁹

Although numerous studies describe these associations between education and health at the individual and interpersonal levels, few address associations at the organizational and community levels. Hence it remains unknown whether higher quality schools contribute to healthier populations.¹⁰ School quality may influence each of the pathways through which educational attainment is hypothesized to impact health. High school (HS), for instance, might offer a critical opportunity to shape long-term health trajectories as this near-universal exposure to school occurs during adolescence, a sensitive developmental period when many adult health-related behaviors commence.^{11,12}

Few studies investigate whether selected school-level characteristics are associated with adult health. Accumulation of educational advantage, such as attending a HS with a higher proportion of wealthy or white students, has been associated with a lower risk of health-related work limitations later in life.¹³ Higher per pupil spending during adolescence has predicted better self-rated health in adulthood.¹⁴ Finally, improvements in school quality—measured by changes in pupil-teacher ratio, teacher salary, and length of the school year—have been associated with lower levels of adult disability and stronger associations between

educational attainment and self-rated health, obesity, and mortality among black students attending Southern schools before and after segregation.^{15,16}

These studies suggest that school quality constitutes an important driver of adult health outcomes and health disparities. However, there are no representative, longitudinal studies to systematically examine aspects of HS quality and long-term health in the context of modern U.S. society.¹⁰ The current study uses longitudinal, nationally representative data to determine whether HS quality is associated with adult health after controlling for individual, family, neighborhood, and school contextual factors.

Methods

We analyzed data from the National Longitudinal Study of Adolescent Health (Add Health). This is a nationally representative sample of 20,745 adolescents in grades 7-12 in the United States during the 1994-95 school year,¹⁷ followed into adulthood with four in-home interviews, the most recent in 2008, when the sample was ages 24-34. Participants were recruited using a stratified random sample of all US high schools. Eighty high schools and 65 feeder schools were enrolled in the study. Wave I (collected in 1994-1995) included in-school and in-home participant surveys, as well as an in-home parent survey. Additionally, a school administrator was surveyed from 79 of the 80 sample high schools. Wave IV (collected in 2007-2008) consisted of a follow-up interview for 15,500 of the initial participants.

We sought to identify whether measures of HS quality were associated with adult health, controlling for other contextual factors. Hence we restricted our sample to participants in grades 9-12 at Wave I who attended a sample HS for which the school administrator survey was available, and who completed the Wave IV survey (Figure 1). The resulting analytic sample includes 7,037 students from 77 high schools.

School Quality Measures

The literature is mixed regarding how to define HS quality.^{18,19} Given that the primary goal of schools is to produce a more educated population, we selected school-level measures previously associated with improved academic outcomes. To validate this approach, we tested whether these measures were associated with HS graduation and college attendance in our sample, after controlling for socio-demographics.

Average Daily attendance—School-wide average daily attendance is associated with improved academic performance, even for students without individual absenteeism.²⁰⁻²² High absentee rates are hypothesized as a marker for low student and family accountability and may result in teachers taking time from instruction to remediate absentee students.^{22,23} In Add Health, school administrators estimated the school's average daily attendance level. Due to the response distribution, we collapsed the original 5-category variable into a 3-level variable with the categories of 75%-89%, 90%-94% and 95%. A sensitivity analysis using the original variable yielded similar results.

Student Promotion Rate—Grade retention and school drop-out rates, both of which are associated with poor academic outcomes at the classroom and school levels, have also been used as measures of HS quality.^{24,25} Low school promotion rates may be a marker for a school's inability to engage or support struggling students.²⁶ School administrators reported the proportion of students in each grade who were held back and the proportion of students in each grade who dropped out of school during the 1993-1994 school year. Correlation between these variables was moderate to high and so, due to concerns for colinearity, we used these responses to calculate the percentage of students in each grade who either were promoted on to the next grade or completed HS and averaged this rate over all grades taught in each school to generate the overall student promotion rate. For ease of interpretation, we standardized the promotion rate such that 1 unit corresponds to 1 standard deviation. A sensitivity analysis using the average grade retention and drop-out rates in separate models yielded similar results.

Parental Involvement—School-level parental involvement is positively associated with academic outcomes.²⁷ One marker for parental involvement is parent participation in school organizations, such as a Parent-Teacher Association.²⁸ This measure is thought to better reflect school-level, as opposed to family-level, educational involvement, as it may convey greater normative social control.²⁹ School administrators estimated the percentage of children with family members in a parent-teacher or other parent organization at school, as a continuous variable. Eleven percent of participants attended a school with no parent organization. To ensure those participants were included in the analysis, a 4-category measure was constructed for the percent of parents involved in school, based on the response distribution (0-14% of participation, 15-29% participation, 30%-100% participation, and no parent organization). Sensitivity analyses using different cut-points as well as with the continuous variable yielded similar results.

Teacher Experience—Teachers' skills have emerged as a particularly important factor in discussions of school quality.³⁰ While studies are mixed regarding how to quantify teacher effectiveness at the individual level, having both experienced teachers and low teacher turnover are associated with improved student achievement at the school level.^{31,32} In Add Health, school administrators estimated the percentage of full-time classroom teachers that had worked at their school for five years or more, which addresses both teacher experience and teacher turnover. The percent reported was standardized, for ease of interpretation, such that 1 unit corresponds to one standard deviation and served as a continuous measure of teacher experience.

Other Potential School Quality Measures—School administrators were asked to estimate the school's average class size, the percent of students testing below, at, and above grade level, the percent of full-time classroom teachers with a master's degree or higher, and the percent of 12th graders who go on to attend either a 2-year or 4-year college. We also explored these measures as possible HS quality indicators.

Academic Outcomes

Individual academic outcomes were used to validate the school quality measures. High school transcripts, collected during Wave III (2001-2002), reported whether a student graduated HS with a diploma, obtained a GED, or neither. We constructed a dichotomous measure of HS diploma or GED versus no diploma and a 3-category outcome of HS diploma versus GED versus neither, to look for dose response patterns. In Wave IV, participants reported their highest level of education. Based on their responses we created both a dichotomous measure of attending college and a 4-category ordered outcome of no college, some college, college completion, and post-college education.

Health Outcomes

We chose outcomes for their high prevalence, impact on morbidity and mortality, and documented associations with education attainment.³⁻⁵ Our primary outcome is general health, which may encompass both physical health and psycho-social well-being. Secondary outcomes of obesity and depression were selected to assess for differential associations between school quality and physical versus mental health domains.

Self-Rated Health—Self-rated health is a well-studied general health measure associated with morbidity and mortality.³³ In Waves I and IV, participants rated their health as excellent, very good, good, fair or poor. Given the response distributions in this relatively young and health population, we used a dichotomous measure of low self-rated health for responses of good, fair, or poor. A sensitivity analysis using the 5-category outcome revealed similar results.

Obesity—Obesity is estimated to affect 35% of US adults and is associated with higher health care utilization, lower quality of life, and increased mortality.^{34,35} In Add Health, self-reported height and weight were collected at Wave I, and measured height and weight at Wave IV. Based on these values we calculated participant body mass index (BMI) and BMI z-score for age and gender. A BMI at or above the 95th percentile in Wave I and 30 in Wave IV was considered obese.

Depression—Depression is among the most common mental health disorders and is associated with poor economic and health outcomes, including increased mortality.^{36,37} At Wave I, respondents completed the Center for Epidemiologic Studies Depression Scale (CES-D) short-form, a 10-item screening for depression symptoms in the previous 7 days.³⁸ A score indicating high risk for depression (≥ 11) served as a dichotomous measure of high risk for depression during HS. In addition, respondents indicated whether they had seriously considered suicide in the previous 12 months. At Wave IV, participants reported whether they had ever been diagnosed with depression.

Covariates

Covariates were selected for their potential associations with both school quality and adult health. School factors included Wave I indicators for school size, type (public or private), urbanicity, and region. Socio-demographics included Wave I measures of participant age, race/ethnicity, gender, household income, highest level of parental education, family

structure, and household language. Neighborhood material deprivation was measured using the 1990 census unemployment rate by block group. To account for the potential for school quality to impact adult health through improved access to health insurance, we controlled for whether the participant lacked health insurance during adolescence (Wave I), young adulthood (Wave III) and middle adulthood (Wave IV). To account for the possibility that improved school quality might impact adult health purely by improving individual academic performance, or that school quality is merely a proxy for the sum of individual academic performances, we controlled for participants' cumulative HS grade point average (GPA), as reported on their school transcripts. GPA might be considered a measure of both cognitive and non-cognitive abilities, both of which might contribute to the associations between education and health.³⁹

Data Analysis

Missing data represented less than 5% of observations for all variables in our analysis, with the exception of household income and health insurance at Wave I, which were missing in 25% and 14% respectively. Because these items were likely to be missing in a non-random fashion, we included a category for missing for these two measures. A sensitivity analysis using multiply imputed data for these variables yielded similar results. Additionally, over 26% of the sample attended a school where no standardized testing was performed. Given the high degree of missing and likelihood for there to be both non-random and heterogeneous reasons for missing we eliminated this variable from our model. Analysis was conducted using the “svy” suite of commands in STATA Corp (Version 12) to account for the three survey design elements: stratification, clustering, and weighting. In particular, our data represent a single-stage design in which clustering occurs at the school level. Standard errors of regression coefficients from the following analyses were estimated using the Taylor linearization method that took into account data clustering, as well as stratification and weights. We used the “subpop” identifier to specify our analytic sample.

Validation of School Quality Measures—To determine whether HS quality measures were associated with HS graduation and college attendance, we used logistic regression for the dichotomous HS graduation and college attendance outcomes and multinomial regression for the 3-category HS graduation and 5-category college attendance outcomes. We examined the associations between potential HS quality measures and each academic outcome, after controlling for school (school size, school type, urbanicity, and region) and individual demographic covariates (age, gender, race/ethnicity, household income, parental level of education, family structure, home language). Finally, all potential school quality variables were included in the same model to examine the independence of the school quality variables. We selected variables for our main analysis that were significantly associated with HS graduation or college attendance with a two-sided p-value ≤ 0.1 in the expected direction and with the expected dose-response trend.

Main Analysis—We tested whether the selected measures of HS quality at Wave I were associated with adult health outcomes at Wave IV, controlling for Wave I adolescent health status. Each health outcome was modeled using survey weights and controlling for school

and demographic covariates, insurance status, individual academic performance, and baseline health in the relevant domain.

Results

Demographics of our analytic sample were similar to the overall Add Health sample (Table 1) but differed slightly with respect to socio-economic status. The analytic sample had significantly greater percentages of female and white participants; were more likely to come from English-speaking households; and were less likely to come from households earning less than \$25,000/year or have parents who did not graduate from HS. A sizable proportion of participants (38%) reported not having health insurance at one of the three time points. Approximately one-third reported less than very good health during adolescence, and nearly 42% reported low self-rated health in adulthood. At Wave I, 34% of adolescents reported symptoms of depression. However, less than 16% of adults in Wave IV reported ever being diagnosed with depression. By Wave IV, nearly 38% were obese. There were no statistically significant differences in the frequencies of the health outcome variables between our analytic sample and those excluded from our analysis.

Most participants graduated from a public HS and went on to pursue higher education. On average, school administrators reported more than two-thirds of the teachers had taught at their school for 5 years and over 91% of students were promoted to the next grade. Approximately 28% of participants attended schools with high average daily attendance and 16% attended schools with low average daily attendance. Parent involvement at participants' schools ranged from 0-100% but nearly half the participants (49%) attended a school where less than 15% of the parents participated.

School Quality and Educational Attainment

School-level average class size, the percent of highly educated teachers, and the percent of 12th graders who go on to attend either a 2-year or 4-year college did not independently predict individual HS graduation or college attendance after controlling for school and demographic covariates. The remaining candidate HS quality measures (average daily attendance, promotion rate, percent of experienced teachers, and parental involvement) all predicted HS graduation or college attendance in both bivariate and multivariate models (results not shown). Logistic regressions of Wave III HS graduation and college attendance on Wave I HS quality (Table 2) revealed that higher promotion rate and exposure to more experienced teachers were associated with higher odds of earning a HS degree or attending college, while lower average daily attendance was associated with lower odds of earning a HS degree or attending college. Attending a HS with no parent-association was associated with lower odds of earning a HS degree. However, attending a school with extremely high levels of parental involvement was also associated with lower odds of earning a HS degree. Multinomial regressions (eTable1) revealed the hypothesized dose response relationship for all school quality variables, again with the exception of parental involvement, as attending a school with extremely high or low parental involvement was associated with lower odds of graduating from HS.

School Quality and Adult Health

School average daily attendance, promotion rate, parent involvement, and teacher experience at Wave I were then used as predictors of adult health outcomes at Wave IV (Table 3, eTable2). After we controlled for socio-demographics, baseline health status, health insurance, and individual school performance, HS quality was significant associated (either positively or negatively) with all adult health outcomes. Attending a HS with low average daily attendance was associated with higher odds of poor self-rated health (adjusted odds ratio (AOR) 1.59, p-value 0.003) and higher odds of being diagnosed with depression (AOR 1.35, p-value=0.03) in adulthood. Higher promotion rate was associated with higher odds of low self-rated health (AOR 1.20, p-value <.001), and higher parent involvement at school was associated with decreased odds of adult obesity (AOR 0.69, p-value 0.001).

Discussion

Several indicators for HS quality significantly predicted adult health outcomes, even after controlling for many likely confounders. These results align with previous longitudinal studies suggesting school quality may be an under-recognized social determinant of health.¹³⁻¹⁶ The effect sizes found in this study are moderate, yet comparable to associations between self-rated health and access to health care and obesity.⁴⁰ For example, a decrease in average daily attendance from 95% and above to 90-94% was associated with a 35% increased odds of depression diagnosis in adulthood. Compared to other variables in the models, the effect sizes for the school quality measures were equal or greater in magnitude than those for parental level of education and having health insurance.

HS quality measures each predicted at least one of our three examined adult health outcomes (self-rated health, depression, obesity), in either the expected or unexpected direction. As expected, lower average daily attendance predicted lower self-rated adult health and higher odds of depression diagnosis, while more school-level parental involvement predicted lower odds of obesity. With respect to obesity, although the school quality validation analyses suggest that some schools with extremely high levels of parental involvement may be schools requiring more parental oversight, parental involvement may nevertheless signify greater overall parent engagement in school, which might result in healthier nutrition and physical activity patterns. The relationship between promotion rate and health, however, appears more complex. A higher school-level promotion rate was associated with low self-rated health in adulthood. It is unclear what underlies this finding. It is possible, for instance, that high promotion rates in the absence of other essential aspects of individual academic achievement or school quality (“social promotion”) might not significantly benefit adult health. Future studies might further explore these findings by delineating the specific mechanisms through which various measures of high school quality might contribute to long-term health.

These results reinforce the notion of schools as critical platforms for population health and the intimate connection between education and health policy. The outcomes associated with school quality in this analysis (self-rated health, depression, and obesity) produce considerable long-term health and economic costs to society. If school quality might be leveraged to prevent negative health outcomes, even small individual level effects might

have large impacts across a population. Identifying specific aspects of school quality that might be leveraged to produce health can inform policy-makers, advocates, educators, and health providers. This may require developing robust school quality measures that go beyond standardized test performance and are specifically focused on population health. Such measures might be used to both identify children at risk for poor adult health outcomes and to develop and evaluate interventions to improve school quality. Given the international conversation about value-based spending, these findings also highlight the need to consider the inter-connectedness of the education and health sectors when calculating societal returns on investment. For example, policies supporting school attendance might be evaluated in terms of both their education and health impacts. Given the recent emphasis on tracking and addressing rates of chronic absenteeism in the United States⁴¹, these results suggest that health advocates might also be engaged in evaluating the benefits of such initiatives.

This study is limited by the school quality measures available in Add Health. In particular, it is possible that school administrators incorrectly estimated the measures included here and that alternative measures, such as per pupil spending or access to school-based health care, might yield different results. Additionally, although we control for many socio-demographic and contextual factors, we cannot exclude the possibility that findings appear significant due to unmeasured variables. In particular, although we controlled for neighborhood level poverty, we were unable to control for the percent of low-income students attending each school. Using HS transcript and school administrator data substantially reduced our sample from the initial study population, which could have introduced bias. Individuals included in our analytic sample were more like to be white and to come from families that were English speaking and of higher socio-economic status. As a result, although our analysis controls for these variables, our findings may not be generalizable to low-income, minority populations. Of note, however, there were no differences in health outcomes comparing those included with those excluded in this analysis. Finally, this study might underestimate the true impact of school quality on health due to both an inability to account for the school environment prior to HS and the lack of follow-up past the 4th decade.

Despite these limitations, this analysis challenges us to think holistically about how education supports population health. Schools are critical public institutions that may have the potential to impact a child's long-term health trajectory. As health advocates, health care providers and public health practitioners may need to consider the degree to which they should engage at school, district, state, and federal levels to support school quality as a mechanism for improving lifelong health and reducing health disparities.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Highlights

- Individual academic achievement is a well-known predictor of health.
- Few studies investigate whether school quality is also associated with long-term health.
- We analyzed Add Health to test whether high school quality predicted adult health.
- High school quality predicted self-rated health, depression, and obesity.
- School quality may be an under-recognized social determinant of health.

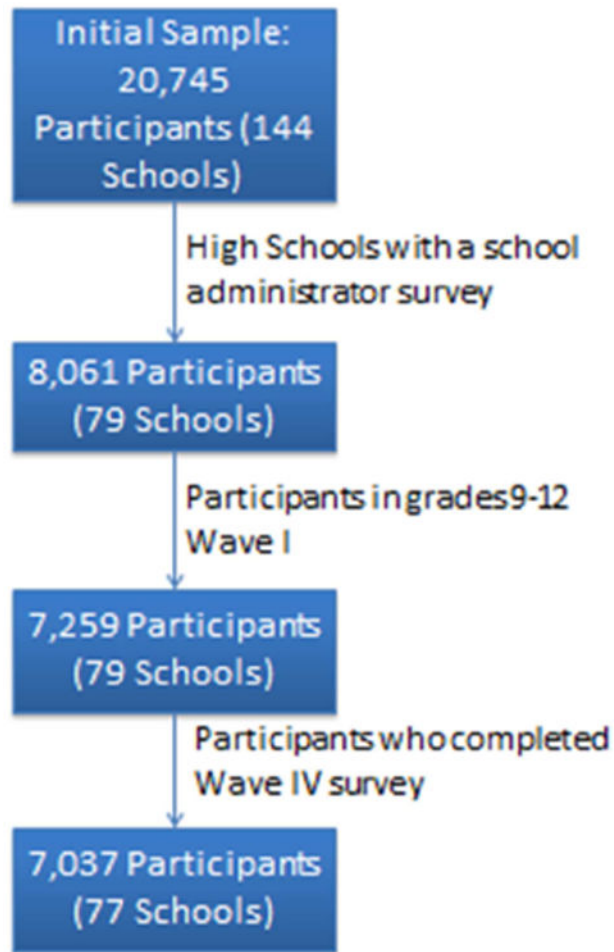


Figure 1. Definition of Analytic Sample

Table 1
Participant Demographics and Descriptive Statistics^a

Measure	Percent (number)/Mean (SD)	Measure	Percent (number)/Mean (SD)
Gender		High School Graduation Status	
Female	51.9% (3760)	High school diploma	90.7% (6400)
Male	48.1% (3277)	GED	5.3% (353)
Age		No diploma or GED	4.1% (283)
13-14	5.5% (367)	Highest Educational Attainment	
15-16	47.6% (3409)	More than college	12.3% (893)
17-18	44.1% (3094)	College degree	23.0% (1658)
19+	2.8% (165)	Some college	34.4% (2433)
Race/Ethnicity		No college	30.3% (2052)
White Non-Hispanic	70.9% (3913)	Mean Cumulative High School GPA	2.6 (0.9)
African American	13.6% (1277)	High School Size	
Hispanic	9.6% (1098)	1001-4000 students	64.5% (4879)
API/Native Amer./Other	5.9% (729)	401-1000 students	25.7% (1611)
Home Language		400 or fewer students	9.8% (547)
English	93.1% (6233)	High School Urbanicity	
Spanish/Other	6.9% (804)	Urban	25.3% (1908)
Annual Household Income		Suburban	56.2% (3752)
\$0-\$24,000	18.7% (1341)	Rural	18.5% (1377)
\$25,000-\$49,000	26.1% (1778)	High School Type	
\$50,000-\$74,000	19.5% (1318)	Public	93.2% (6532)
\$75,000 or more	12.6% (836)	Private	6.8% (505)
Missing	23.1% (1764)	Region	
Highest Parental Education		West	17.2% (1793)
Less than high school degree	10.5% (787)	Midwest	33.7% (1972)
High school graduate/GED	30.9% (1884)	South	36.4% (2440)
Some college	22.8% (1487)	Northeast	12.7% (832)
College degree or more	35.8% (2560)	Average % of experienced teachers at the high school	68.6% (20.5)
Family Structure		Average high school promotion rate	91.2 (7.9)
2 Biological parents	58.3% (3958)	Average high school daily attendance	
1 Biologic/1 step-parent	16.0% (1208)	95% or more	28.3% (1845)
Single parent	19.8% (1486)	90%-94%	55.7% (3522)
Other	5.9% (385)	75%-89%	16.0% (1670)
Health Insurance Status		Average % of parents involved in school PTA	
No health insurance at Wave I	10.0% (705)	30-100%	18.5% (1407)

Measure	Percent (number)/Mean (SD)	Measure	Percent (number)/Mean (SD)
No health insurance at Wave III	23.7% (1598)	15-29%	18.3% (1037)
No health insurance at Wave IV	18.4% (1224)	0-14%	48.6% (3820)
		No PTA at the school	14.5% (773)
Adolescent Health		Adult Health	
Low self-rated health	32.7% (2282)	Low self-rated health	41.6% (2933)
Positive symptoms of depression	33.6% (2442)	Diagnosis of Depression	15.5% (1004)
Suicidal ideation	15.2% (999)	Obesity	38.5% (2650)
Obesity	9.9% (683)		

^aPercentages reflect survey weights, SD= standard deviation, PTA=Parent teacher association.

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Table 2
Logistic Regressions of High School Graduation and College Attendance on School Quality Measures^a

	High School Graduation or GED		College Attendance	
	Odds Ratio	95% CI	Odds Ratio	95% CI
Average Daily Attendance				
95% and above	Reference			
90%-94%	0.71	0.41 – 1.22	0.92	0.67 – 1.26
75%-89%	0.41	0.17 – 1.03	0.69	0.44 – 1.07
Promotion Rate (unit=1 SD)	1.30	0.99 – 1.69	1.18	0.98 – 1.41
% Experienced Teachers (unit=1 SD)	1.62	1.29 – 2.02	1.24	1.10 – 1.39
Parental Involvement				
0%-14%	Reference			
15%-29%	0.81	0.30 – 2.15	0.98	0.72 – 1.34
30%-100%	0.60	0.33 – 1.07	1.26	0.85 – 1.85
No PTA	0.27	0.13 – 0.56	0.85	0.65 – 1.11

^a95% CI= 95% Confidence Interval, SD= Standard deviation, PTA= Parent teacher association. Models control for school size, school type, urbanicity, region, age, gender, race/ethnicity, household income, parental level of education, family structure, and home language.

Table 3
Associations between High School Quality and Adult Health Outcomes Adjusted for Covariates^a

	Low Self-Rated Health		Diagnosis of Depression		Obesity	
	Odds Ratio	95% CI	Odds Ratio	95% CI	Odds Ratio	95% CI
Average Daily Attendance						
95% and above	Reference					
90%-94%	1.09	0.87 - 1.36	1.35*	1.04 - 1.75	1.00	0.85 - 1.19
75%-89%	1.59**	1.17 - 2.16	1.36	0.92 - 2.02	1.19	0.90 - 1.57
Promotion Rate (unit=1 SD)	1.20***	1.09 - 1.32	1.16	1.00 - 1.35	1.02	0.90 - 1.17
% Experienced Teachers (unit=1 SD)	0.95	0.87 - 1.03	1.10	0.98 - 1.24	0.95	0.87 - 1.03
Parental Involvement						
0% - 14%	Reference					
15% - 29%	1.18	0.94 - 1.48	1.18	0.85 - 1.63	1.06	0.80 - 1.39
30% - 100%	1.07	0.83 - 1.38	0.85	0.60 - 1.21	0.69**	0.55 - 0.85
No PTA	1.04	0.80 - 1.34	1.18	0.85 - 1.63	1.06	0.80 - 1.39

* p<.05;

** p<.01;

*** p<.001.

^a 95% CI=95% Confidence Interval, SD= Standard deviation, PTA= Parent teacher association. Each of the three models control for baseline health outcomes, school size, school type, urbanicity, region, age, gender, race/ethnicity, household income, parental level of education, family structure, home language, neighborhood unemployment, lack of health insurance, and individual grade point average.