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# Standards-based physical education in schools: The role of state laws

**Kyle Sprow**[1], **Frank M. Perna**[1], **Julien Leider**[2], **Lindsey Turner**[3], **Elizabeth M. Piekarz-Porter**[2,4], **Shannon L. Michael**[5], **Nancy Brener**[6], **Jamie F. Chriqui**[2,4]

[1]Division of Cancer Control and Populations Sciences, National Cancer Institute, National Institutes of Health, Rockville, MD

[2]Institute for Health Research and Policy, University of Illinois at Chicago, Chicago, Illinois

[3]College of Education, Boise State University, Boise, Idaho

[4]Division of Health Policy and Administration, School of Public Health, University of Illinois at Chicago, Chicago, Illinois

[5]Division of Population Health, Centers for Disease Control and Prevention, Atlanta GA

[6]Division of Adolescent and School Health, Centers for Disease Control and Prevention, Atlanta, GA

## Abstract

**Purpose.—**Examine the association of state physical education (PE) laws (https://class.cancer.gov) with school policies addressing motor skill development, physical activity (PA) participation, and health-enhancing physical fitness (https://www.cdc.gov/healthyyouth/data/shpps/data.htm).

**Methods.—**National school-level data on PE standards were obtained from the 2014 School Health Policies and Practices Study (SHPPS) of US schools for analytical samples of 408–410 schools in 43 states. These data were linked to Classification of Laws Associated with School Students (CLASS) data, which reflect the strength of state-PE curriculum laws and the associated state PE curriculum standards. Logistic regressions and generalized linear models with a complementary log-log link examined associations between state law and school-level standards.

**Results.—**Compared to having no state law, weak law (OR: 5.07, 95% CI: 1.02–25.27) or strong law (OR: 2.96, 95% CI: 1.04–8.37) was associated with higher odds of school PE standards addressing motor skill development, while only strong state law was associated with higher prevalence of addressing achievement and maintenance of physical fitness (coefficient: 0.63, 95% CI: 0.12, 1.14). State laws were not associated with addressing PA participation.

**Conclusions.—**Schools were more likely to address motor skills and physical fitness development when states had strong PE laws.

**Corresponding Author** Frank M. Perna, Ed.D., Ph.D., National Cancer Institute, 9609 Medical Center Drive, East Tower, Rm. 3E104, Bethesda, MD 20892 (regular mail), Rockville, MD 20850 (hand delivered mail), Phone: (240) 276-6782, Fax: (240) 276-7907, pernafm@mail.nih.gov.

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**Keywords**

Physical education; legal epidemiology; policy; CLASS; physical fitness; motor skills

## Introduction

The second edition of the Physical Activity Guidelines for Americans highlights the myriad of health benefits that are associated with physical activity (1). Children and adolescents who engage in the federally recommended amount of 60 minutes or more of daily moderate-to-vigorous physical activity gain improvements in bone health, weight status, cardiorespiratory and muscular fitness, cardiometabolic health, cognition, and have a reduced risk of depression (1). Unfortunately, only about 24% of children ages 6 to 17 meet the guidelines for daily physical activity (2). The prevalence of physical inactivity and obesity increases from early childhood through adolescence and disproportionally affects racial and ethnic minorities (3,4). Children who are physically inactive and those with excess body weight are more likely to become obese adults, thereby conferring an increased risk for the leading causes of morbidity and premature death, which are associated with exponential increases in health care costs (5). School-based physical activity may improve mental and physical health, body weight status, and provide students the necessary opportunities to develop life-long physical activity habits (6–9).

Recognizing that children spend much of their day in school, the National Physical Activity Plan Alliance (NPAPA) highlights several strategies that schools can use to equip students with the knowledge, skills, and confidence to be physically active (6). The NPAPA endorses the Comprehensive School Physical Activity Program (CSPAP), a multi-component approach in which schools incorporate physical activity before, during, and after the school day (6,10). The foundation of CSPAP is physical education (PE) classes that endorse National PE Standards from the Society of Health and Physical Educators (SHAPE America) (11,12). While the benefits of PE classes include increasing students' level of physical activity, improving grades and standardized test scores, and helping students stay on-task in the classroom (10), the lack of regulations surrounding PE practices affects both the quantity and quality of PE delivered to students (13,14). Evidence indicates that PE classes that are based on SHAPE America standards provide a larger amount and quality of physical activity to students (11,15). Prior studies have documented that strong, codified state laws with specific time requirements for PE are an important policy lever for adequate PE time and to help students accumulate daily physical activity while in school (16). State PE laws may also be a means of incorporating additional national PE standards (e.g., SHAPE America) such as motor skill development, physical activity participation, and health-enhancing physical fitness within PE classes, but the association between state PE standards-related laws and these school policy outcomes has not been assessed on a national level.

Therefore, the purpose of this study is to examine whether schools are more likely to address the motor skill competence, physical activity participation, and health-enhancing physical fitness national standards within their PE curriculum when located in states with

stronger PE-related laws and curriculum standards (i.e., state law with specific requirements corresponding to nationally recognized guidance (12 & 13)). We hypothesized that schools in states classified as having relatively strong state laws and standards would be most likely to meet recommendations for PE practices and policies regarding motor skill development, physical activity participation, and achievement and maintenance of a health-enhancing level of physical fitness.

## Methods

### Data Sources.

The Classification of Laws Associated with School Students (CLASS, see https://class.cancer.gov/Methodology) 2013 database and the 2014 School Health Policies and Practices Study (SHPPS, see https://www.cdc.gov/healthyyouth/data/shpps/data.htm) were used to determine the strength of state law and provision of school PE policy and practices, respectively.

### State Codified Law.

CLASS uses a scoring system to classify codified state laws as they compare to national standards and recommendations for PE and nutrition; scores for PE laws are available at the elementary, middle, and high school level and have been described elsewhere (14,16). For purposes of this analysis, CLASS data that incorporate state curriculum standards (in addition to codified law) were used. (For purposes of brevity, we will refer to the laws and standards collectively as laws in the remainder of this paper.) Briefly, CLASS codes state laws according to their stringency and specificity. For our analyses, laws were re-coded from the original CLASS ordinal scoring system (typically ranging from 0 to 5 or 6 depending on the item) into a categorical ranking of none (0), weak (1), or strong (2). State laws that were re-coded as: “none” had no requirement or recommendation for PE curriculum; “weak” recommended or had non-specific PE requirements; and “strong” required specific PE standards within the curriculum. Similar CLASS categories of “strong,” “weak,” and “none” have been used in previous research (16,17,18). Current and past CLASS scores by grade level are available for all states and the District of Columbia (see https://class.cancer.gov).

### School PE Policy and Practices.

Nationally representative school-level data on PE standards were obtained from the 2014 SHPPS. SHPPS is a national survey periodically conducted by the Centers for Disease Control and Prevention (CDC) to assess school health policies and practices at the state, district, school, and classroom levels. Our analysis focused only on school-level data available from public schools, specifically from the Physical Education and Activity School Questionnaire of the 2014 SHPPS. School-level data were collected by computer-assisted personal interviews with designated faculty or staff respondents in a nationally representative sample of elementary, middle, and high schools. Respondents had primary responsibility for or were the most knowledgeable about the school health program component being studied; 78% of respondents to the Physical Education and Activity School Questionnaire in the analytic sample were PE teachers.

The 2014 Physical Education and Activity School Questionnaire within SHPPS addressed six specific curriculum standards, three of which are relevant to our hypothesis and overlapped with relevant state laws captured by CLASS coding criteria (competence in motor skills, regular participation in physical activity, and achievement of health-enhancing level of physical fitness). Questions about these specific standards were skipped if respondents answered no to an earlier question asking whether their school followed any national, state, or district PE standards. For this analysis, those cases were recoded to "no." These SHPPS data were linked to the 2013 CLASS data on state-level codified laws addressing PE curriculum standards based on state name and grade level. The 2013 CLASS data (i.e., laws effective as of December 31, 2013) were linked to the SHPPS data to ensure that the state law data were in effect at the time of the SHPPS survey (February-June 2014).

Of the 582 schools that completed the 2014 SHPPS Physical Education and Activity School Questionnaire, 463 were public schools of which 417 had complete data on covariates. Missing data on specific SHPPS items left 410 schools eligible for analyses of PE standards for motor skills and participation in physical activity and 408 schools eligible for analyses of standards for physical fitness. The analytical sample was located in 43 states, excluding only Alaska, Delaware, the District of Columbia, New Hampshire, New Mexico, South Carolina, and Vermont, for which no schools were sampled in the 2014 SHPPS, and Oregon, for which schools were sampled but none were included in the analytical sample after the exclusions noted above.

### School-level covariates.

School level (elementary, middle, or high school) was obtained from the 2014 SHPPS data file. Region was computed by state, based on Census classifications (19). All remaining covariates were provided through a restricted use agreement with the Centers for Disease Control and Prevention for purposes of this analysis. Data on student racial/ethnic composition, locale, free/reduced-price lunch eligibility, and enrollment were sourced from the National Center for Education Statistics (NCES) by Market Data Retrieval and linked to the SHPPS data sets. A categorical variable for majority race was created using a categorization that has historically been used to differentiate school-level race and ethnicity: ≥66% non-Hispanic white, ≥50% non-Hispanic black, ≥50% Hispanic, and other racial composition (20). Locale was based on metro-centric locale codes, which were collapsed from eight to four levels coded as city, suburban, town, and rural. The percentage of students eligible for free or reduced-price lunch was computed and categorized as low (≤40%), medium (40–75%), or high (≥75%) (21, 22). Student enrollment was categorized in three levels with different cutoffs for elementary and middle schools as opposed to high schools, to maintain a roughly equal distribution across the three school levels. Specifically, enrollment was categorized as small (elementary/middle schools: ≤300, high schools: ≤350), medium (elementary/middle schools: 301–500, high schools: 351–800), or large (elementary/middle schools: >500, high schools: >800).

### Data Analysis.

Descriptive statistics were calculated to describe school and state law characteristics and relative frequencies for elementary, middle, and high schools. Multivariable logistic

regressions were used to test the association of school PE standards with state law, controlling for school-level characteristics: school level, size, student socioeconomic status, racial/ethnic composition, and locale. Due to limited within-region variation in state law, models did not control for region. Odds ratios, adjusted for covariates, were calculated to show the odds that reported school policy addressed the specified PE standard (e.g., Motor skill competence, Participation in physical activity, etc.) based on exposure to weak or strong state PE laws compared to the absence of state PE law.

A generalized linear model with complementary log-log link was used in one case (i.e., school PE policy for health-enhancing fitness standard) where the logistic regression model failed a link test. Link tests were used to verify model fit. In the generalized linear model, positive coefficients indicate a positive association between the relative strength of state law and school PE addressing health related fitness. Adjusted prevalence estimates were computed from all models comparing predicted prevalence of the given standards at different levels of state law strength. All analyses were conducted in Stata version 13.1, using *svy* commands to account for the SHPPS survey design.

## Results

Descriptive statistics are listed in Table 1. Most elementary, middle, and high schools in our analysis had PE standards addressing competence in motor skills and movement patterns needed to perform a variety of physical activities (91.0%, 92.4%, and 91.9%, respectively), regular participation in physical activity (92.3%, 96.4%, 94.4%, respectively), and achievement and maintenance of a health-enhancing level of physical fitness (86.0%, 94.3%, and 94.6%, respectively). Most schools were located in a state with a strong policy with specific requirements for PE curriculum standards for their school level (70.8% of elementary schools, 77.2% of middle schools, and 76.5% of high schools). For the elementary, middle, and high schools in our analysis, the majority of schools had predominately white populations (49.9%, 51.9%, and 57.1%, respectively) and the greatest proportion of schools were considered to have large enrollment (40.7%, 45.5%, and 41.2%, respectively). The elementary schools were slightly more likely to be in a suburban region (37.3%), whereas the middle schools were equally likely (32.1%) to be suburban or rural; high schools were more likely to be rural (39.8%). The elementary schools (27.7%) were more likely to have a high number of students eligible for free/reduced-price lunch program as compared to the middle (19.7%) and high (11.1%) schools.

In comparison to states with no PE-related laws, having a weak or non-specific state law and having a strong state law on curriculum standards were both associated with higher odds of school PE standards addressing competence in motor skills (OR = 5.07 (95% CI 1.02 – 25.27) and OR = 2.96 (95% CI 1.04 – 8.37)), respectively) across school levels. School level was not associated with schools addressing motor skills competency within PE, but schools with a higher percentage of students eligible for free/reduced-price lunch were less likely to address motor skills competency within PE. Neither weak nor strong state laws were significantly associated with school PE standards addressing regular participation in physical activity (OR = 2.80 (95% CI 0.36 – 21.82) and OR = 1.67 (95% CI 0.50 – 5.62), respectively) (Table 2).

Additionally, strong, specific state laws, relative to no law, were positively associated with school standards for PE addressing achievement and maintenance of a health-enhancing level of physical fitness (coefficient = 0.63 (95% CI 0.12 – 1.14)), but weak or non-specific state laws were not significantly associated with school standards in this area (coefficient = 0.48 (95% CI −0.18 – 1.14)) (Table 3). School PE standards addressing achievement and maintenance of physical fitness were more common at the middle and high school level, but tests of the interaction of state law and school level were not statistically significant. Interaction terms between state law and school level were not included in the final model shown because they were not statistically significant and reduced our statistical power.

Figure 1 depicts the adjusted prevalence estimates of school PE standards by strength of state law, computed from the three preceding models. Specifically, the adjusted prevalence estimates show the average predicted prevalence of each standard if all schools were exposed to the given level of state law. The adjusted prevalence estimates of school PE standards addressing competence in motor skills were higher with both a weak/non-specific state law (94.9%) or a strong state law (91.8%) relative to no state law (80.4%). The adjusted prevalence estimate of school PE standards for physical fitness was higher only with a strong state law (91.7%) relative to no state law (75.7%) but having a weak/non-specific state law was not significantly associated with this outcome ($p > .05$). School PE standards addressing regular participation in physical activity were not significantly associated with state law ($p > .05$).

## Discussion

Our study assessed whether schools located in a state with codified PE curriculum standard-related laws and specific standards addressing motor skill competence, physical activity participation, and health-enhancing physical fitness were more likely to address these standards within their PE curriculum compared to schools located in states without such laws. In a nationally representative sample of elementary, middle, and high schools across the United States, adjusted prevalence analyses illustrate that greater than 75% of schools addressed one or more of these three PE standards, regardless of state law (Figure 1). Despite this high prevalence, schools located in states with strong codified PE-standard related laws still had higher odds of addressing standards for motor skills competence within their PE curriculum as compared to schools located in states with no laws. Additionally, strong state law, relative to no policy, was associated with higher odds of school PE standards addressing achievement and maintenance of a health-enhancing level of physical fitness. However, state law was not significantly associated with having school PE standards that address regular participation in physical activity.

These findings complement and extend previous work demonstrating that strong, codified laws were associated with greater time allotment for PE in an analysis of 2006 data (16); whereas the current study revealed a non-significant association of state law with the 2014 SHPPS data concerning PE standards regarding regular participation in general physical activity. There are three likely reasons for this dichotomy. First, it may be that there is no reliable association of state PE laws with related school-level standards for PE to address students' general physical activity participation in school. Alternatively,

given the high percentage of schools that address physical activity, a ceiling effect may prohibit the ability of state laws to account for additional variance in physical activity time. Lastly, it is possible that regular participation in physical activity during PE may differ substantially from PE time allotment (23). The provision of quality PE is posited to be distinct from physical activity as part of a CSPAP, where guidelines for PE are specific and distinct from recommendations regarding time for other physical activity opportunities (e.g., recess, classroom physical activity). For example, curriculum objectives of PE may include developing students' competence in motor skills and achievement in health-enhancing fitness, whereas participation in other school-related physical activity opportunities may support these objectives but should not supplant dedicated PE time and curricula objectives (24).

Given the vast amount of time students spend in school, PE classes present an opportunity to promote physical activity and help mitigate unhealthy behaviors throughout childhood, but only if the quantity and quality of physical activity within these courses is appropriate (6, 9, 10, 23–24). The association of strong PE laws with promotion of health-enhancing fitness in school PE, which was not apparent in schools within states with weak PE laws, is of particular interest. Cardiorespiratory and skeletal muscle fitness have been favorably associated with cardiovascular and metabolic health profiles of children, and a meta-analysis of PE and other school-based activity programs documents the effectiveness of these programs to improve fitness in children (25). Further, both cardiorespiratory and muscular fitness in adolescence have been reported to correlate with fitness parameters well into adulthood (26). Both cardiorespiratory and muscular fitness in adulthood are well documented to be inversely associated with morbidity and mortality (27,28). While assessment of cardiorespiratory fitness in children did not occur in the SHPPS data collection methodology, it is reasonable to surmise that strong state laws that translate to effective school-level practices in PE may favorably affect fitness in children and impart beneficial health effects to them during childhood and possibly later in life.

Additionally, many studies have illustrated a strong association between motor skill competence, increased time spent in moderate-to-vigorous physical activity, and a decrease in sedentary behavior (29–31). Given the principles surrounding specificity of training (1, 30), it is plausible that physical activity and motor skill development are associated but not necessarily reciprocal (31). That is, children must engage in some level of physical activity to develop motor skill competence, but motor skill competence is only achieved by participating in some physical activities structured for that purpose. Moreover, children who develop motor skills at an early age are likely to experience success and have a more positive relationship with physical activity and sports as compared to their peers who do not possess comparable motor skills (32). To combat the decline in youth sports participation, The Aspen Institute and the United States Olympic Committee have endorsed new frameworks that emphasize the need for motor skill competence as a key factor not only for athletic development but also for long-term participation in sports (32,33). With overwhelming evidence indicating that active children become active adults (1,34), PE classes that emphasize motor skill development, especially at early grade levels where motor skill competence is most malleable (36), provide a propitious strategy to promote lifelong physical activity habits.

## Limitations

As with all cross-sectional studies, we only examined the relationship between state laws and school policies and cannot determine causal effect of state laws on school policy; also, we were unable to account for state-level clustering while simultaneously accounting for the SHPPS survey design. Second, the SHPPS data are based on self-reported surveys, and, as such, are subject to bias from respondent knowledge, question interpretation, and social desirability. Third, school-level SHPPS data on PE standards did not include data on specific time requirements for regular participation in physical activity, so we could only examine whether any standard for regular participation in physical activity was in place without looking at specific time requirements. Similarly, we do not know the degree to which students enhanced their motor skills. While SHPPS data are nationally representative and may be compared by CLASS classification (e.g., to compare schools in states with relatively strong laws to schools in states with weak laws), SHPPS data are not state representative; as such, we did not perform a state-level summary of the SHPPS data. Last, this study only examined the relationship between state laws (and relevant state curriculum standards) and school standards but did not account for the potential mediating impact of school-district policies. However, state codified law and curriculum standards establish minimum PE requirements that districts must implement in schools. Another consideration is that noncodified state policies (guidelines, recommendations, procedures) are not captured by CLASS. As such, states may have other policies that influence school PE, but because these policies were not formally codified into law or incorporated into the state curriculum standards, they were not accounted for in this analysis. However, these noncodified policies would not carry the force of law and would allow considerable discretion with respect to implementation.

## Conclusion

School-level PE standards are more likely to address motor skill development and the achievement and maintenance of a health-enhancing level of physical fitness when states have strong laws with specific PE standard requirements. Strong codified law may be a policy lever to ensure that school practices increase opportunity for motor skill and health-enhancing physical fitness development that may ultimately improve children and adolescents' life-long physical activity habits, fitness, and health.

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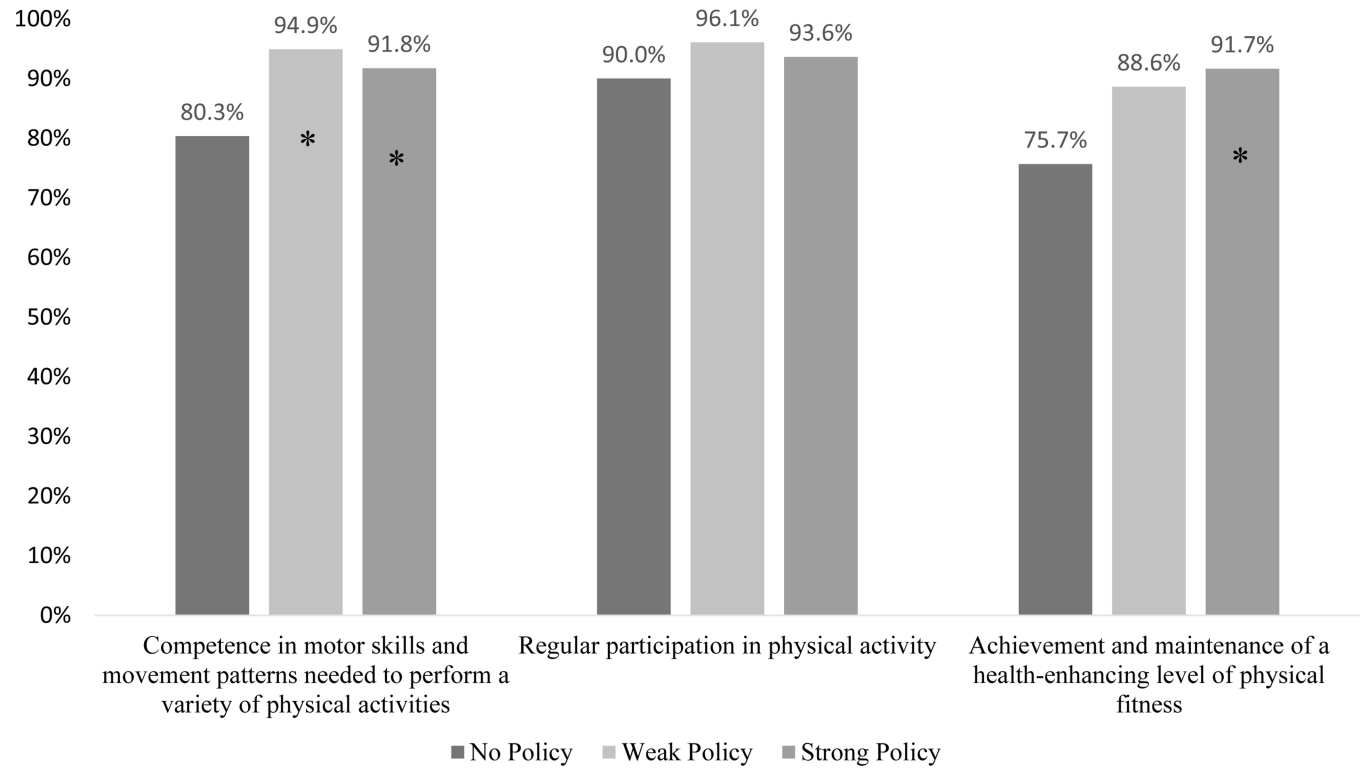


**Figure 1.**

Adjusted Prevalence of School PE Standards by State Law Coding

Note: Adjusted prevalence estimates were computed from the three models, showing average predicted levels of the given PE standards at each level of state law coding. Specifically, the adjusted prevalence shows the average predicted prevalence of each standard if all schools were exposed to the given level of state law.

*Indicates difference relative to “no policy” coding is statistically significant at the p<.05 level in regression model.

**Table 1.**

Descriptive Sample Characteristics of Schools by School Level: School Health Policies and Practices Study, 2014

| Variable | Elementary School (%) | Middle School (%) | High School (%) |
|---|---|---|---|
| School PE Standards Address Competence in Motor Skills | 91.0 | 92.4 | 91.9 |
| School PE Standards Address Regular Participation in Physical Activity | 92.3 | 96.4 | 94.4 |
| School PE Standards Address Health-Enhancing Physical Fitness | 86.0 | 94.3 | 94.6 |
| CLASS PE Standards: | | | |
| No policy | 7.1 | 8.3 | 12.8 |
| Weak or non-specific policy | 22.1 | 14.5 | 10.8 |
| Strong policy with specific requirements | 70.8 | 77.2 | 76.5 |
| Student Race/Ethnicity:[a] | | | |
| Majority White (≥66%) | 49.9 | 51.9 | 57.1 |
| Majority Black (≥50%) | 14.3 | 11.6 | 12.6 |
| Majority Hispanic (≥50%) | 15.7 | 15.1 | 14.8 |
| Other racial composition | 20.1 | 21.4 | 15.5 |
| Locale: | | | |
| City | 29.7 | 24.5 | 17.5 |
| Suburban | 37.3 | 32.1 | 33.2 |
| Town | 11.4 | 11.3 | 9.5 |
| Rural | 21.6 | 32.1 | 39.8 |
| Free/Reduced-Price Lunch Eligibility: | | | |
| Low (≤40% of students) | 36.0 | 40.3 | 49.9 |
| Medium (40 to 75%) | 36.3 | 40.1 | 39.0 |
| High (≥75%) | 27.7 | 19.7 | 11.1 |
| Student Enrollment: | | | |
| Small | 25.9 | 30.7 | 32.5 |
| Medium | 33.4 | 23.8 | 26.3 |
| Large | 40.7 | 45.5 | 41.2 |

Note: Descriptive statistics are survey-weighted and were computed for all observations from public schools that had no missing data for any school-level contextual controls. N's vary slightly across items and from those for regressions due to SHPPS item-specific missing data. N=147–150 elementary schools, 119–123 middle schools, and 142–144 high schools.

Student enrollment defined as: Small (elementary/middle schools: ≤300, high schools: ≤350), Medium (elementary/middle schools: 301–500, high schools: 351–800), and Large (elementary/middle schools: >500, high schools: >800).

[a] A categorical variable for a school's majority racial composition was created with the following levels: ≥66% non-Hispanic white, ≥50% non-Hispanic black, ≥50% Hispanic, and other racial composition/majority Asian or Native American.

**Table 2.**

Association Between Codified State Laws and Motor Skill Competence and Participation in Physical Activity within School PE Standards

| | MOTOR SKILLS | | PARTICIPATION IN PHYSICAL ACTIVITY | |
|---|---|---|---|---|
| **Variable** | **Odds Ratio (OR)** | **95% Confidence Intervals (CI)** | **Odds Ratio (OR)** | **95% Confidence Intervals (CI)** |
| CLASS PE Standards: | | | | |
| Weak or non-specific policy | 5.07* | 1.02, 25.27 | 2.80 | 0.36, 21.82 |
| Strong policy with specific requirements | 2.96* | 1.04, 8.37 | 1.67 | 0.50, 5.62 |
| School Level: | | | | |
| Middle School | 1.26 | 0.47, 3.40 | 2.46 | 0.82, 7.35 |
| High School | 1.12 | 0.46, 2.70 | 1.61 | 0.52, 5.04 |
| Student Race/Ethnicity: | | | | |
| Majority Black (≥50%) | 3.64+ | 0.78, 16.95 | 0.55 | 0.10, 2.92 |
| Majority Hispanic (≥50%) | 0.84 | 0.29, 2.41 | 1.34 | 0.18, 9.95 |
| Other racial composition | 1.17 | 0.34, 4.00 | 0.51 | 0.15, 1.72 |
| Locale: | | | | |
| Suburban | 0.85 | 0.27, 2.71 | 0.41 | 0.08, 2.25 |
| Town | 0.32+ | 0.10, 1.09 | 0.20+ | 0.03, 1.22 |
| Rural | 0.57 | 0.15, 2.25 | 0.35 | 0.05, 2.33 |
| Free/Reduced-Price Lunch Eligibility | | | | |
| Medium (40 to 75%) | 0.81 | 0.30, 2.18 | 0.65 | 0.23, 1.88 |
| High (≥75%) | 0.24* | 0.08, 0.72 | 1.08 | 0.21, 5.69 |
| Student Enrollment | | | | |
| Small | 0.77 | 0.29, 2.06 | 0.62 | 0.14, 2.85 |
| Medium | 1.41 | 0.45, 4.40 | 0.74 | 0.21, 2.63 |

Note: Referent groups have been omitted from this table. Results are from logistic regression models (link tests were performed to verify model fit) and include all covariates in the Table. Having a weak or non-specific state law and having a strong state law on curriculum standards were both associated with higher odds of school PE standards addressing competence in motor skills relative to having no state law on curriculum standards. State law is not significantly associated with whether school PE standards address regular participation in physical activity.

* $p < .05$

+ $p <. 10.$

**Table 3.**

Association Between Codified State Laws and Health Enhancing Physical Fitness within School PE Standards

| Variable | Coefficients | 95% Confidence Intervals (CI) |
|---|---|---|
| CLASS PE Standards: weak policy or strong non-specific policy | 0.48 | −0.18, 1.14 |
| CLASS PE Standards: strong policy with specific requirements | 0.63* | 0.12, 1.14 |
| School Level: Middle School | 0.35* | 0.02, 0.68 |
| School Level: High School | 0.42* | 0.03, 0.81 |
| Majority Race: Black (≥50%) | 0.23 | −0.36, 0.82 |
| Majority Race: Hispanic (≥50%) | −0.16 | −0.75, 0.44 |
| Other racial composition | −0.12 | −0.58, 0.35 |
| Locale: Suburban | 0.31 | −0.20, 0.83 |
| Locale: Town | −0.14 | −0.78, 0.50 |
| Locale: Rural | 0.22 | −0.29, 0.73 |
| Medium Free/Reduced-Price Lunch Eligibility | −0.04 | −0.44, 0.35 |
| High Free/Reduced-Price Lunch Eligibility | −0.12 | −0.61, 0.36 |
| Small Enrollment | −0.45* | −0.87, −0.03 |
| Medium Enrollment | −0.45* | −0.85, −0.04 |

Note: Results are from a generalized linear model with a complementary log-log link. This was used because the logistic model failed the link test. Positive coefficients indicate positive associations, while negative coefficients indicate negative associations. Strong, specific state laws relative to no law were positively associated with school standards for PE addressing achievement/maintenance of a health-enhancing level of physical fitness, but weak or non-specific state laws were not significantly associated with school standards in this area. We tried interacting state law with school level here. However, the interaction terms were not significant and reduced our power, so those results are not shown.

* $p < .05$.