



Published in final edited form as:

J Sch Health. 2019 June ; 89(6): 494–502. doi:10.1111/josh.12762.

Physical Education Policies in US Schools: Differences by School Characteristics*

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Abstract

BACKGROUND: We assessed the extent to which schools in the United States implement physical education policies identified in SHAPE America's *Essential Components of Physical Education* document and how implementation of these policies varies by school characteristics.

METHODS: School policy data were collected as part of the 2014 School Health Policies and Practices Study via computer-assisted personal interviews in a nationally representative sample of K-12 schools and were linked to extant data on school characteristics. Bivariate analyses and Poisson regression model were used to examine how physical education policies differed by school characteristics.

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Humans Subjects Approval Statement

SHPPS was reviewed by an institutional review board at CDC and was determined to be exempt under federal regulation 45 CFR 46.101(b).

RESULTS: Five physical education policies varied by region and 3 varied by school level. Requiring certified, licensed, or endorsed physical education teachers varied by all school characteristics except school level and percentage of students eligible for free or reduced-price lunch. The average number of physical education policies implemented by schools was 3.0. The number of policies varied by metropolitan status and school level.

CONCLUSIONS: The findings suggest many schools are only implementing a few of the physical education policies that can strengthen their physical education programs. These findings can be used to target professional development and technical assistance for physical education practitioners on policy and implementation.

Keywords

physical education; school health policies and practices; policy implementation

National guidance states schools should provide daily physical education to students from kindergarten through high school (K-12).^{1,2} However, only 4% of schools nationwide achieve this.³ Physical education is an academic subject with a planned, sequential, K-12 curriculum and instruction that provides students with the knowledge, skills, and confidence to be physically active for a lifetime.^{1,4} Despite many benefits of students being physically active during school, such as increased attention and memory, better behavior, and improved grades and test scores,^{5,6} schools across the nation are limiting physical education and reallocating time and resources to other academic classes and education efforts.²

To explain and help schools develop effective physical education programs, SHAPE America developed the *Essential Components of Physical Education* document.⁴ This document identifies 4 essential components to help schools create a strong foundation for physical education programs: (1) policy and environment; (2) curriculum; (3) appropriate instruction; and (4) student assessment. Specifically, the policy and environment component raises awareness of the critical policies that need to be in place to ensure physical education is part of a well-rounded education for all students. The policies in this component include providing daily physical education; prohibiting waivers, substitutions, and exemptions; limiting class size; not assigning or withholding physical activity as punishment; ensuring full inclusion of all students in physical education; and having state-licensed or state-certified teachers who are endorsed to teach physical education. See Table 1, column 2 for exact language.

Most of these physical education policies have been examined at the state and school district level through the Shape of the Nation and Bridging the Gap studies.⁷⁻¹⁰ In addition, some studies have examined the impact of state or district physical education policies on time spent in physical education, students' level of physical activity, and weight status.¹¹⁻¹⁴ Separate literature reviews conducted by the Institute of Medicine and Active Living Research underscore the importance and impact of physical education policies at the school level.^{2,15} These reviews as well as other studies concluded that strongly worded and well-monitored physical education policies have the potential to improve physical education programs and increase physical activity levels among students.^{2,15,16} It is important for policy makers and physical education leaders to understand which physical education

policies need to be put in place and strengthened to ensure the future and effectiveness of physical education programs. This information also is needed to inform and better design trainings and technical assistance for physical education leaders and practitioners at schools. To our knowledge, however, no studies have assessed the extent to which the physical education policies in the *Essential Components of Physical Education* document have been implemented in schools nationwide, or how these policies differ by school characteristics.

The School Health Policies and Practices Study has provided data on physical education policies since 1994 but has not examined differences in each of these policies by school characteristics (see www.cdc.gov/shpps). To address this gap, data from 2014 School Health Policies and Practices Study were used to examine the extent to which schools implement the policies identified in the *policy and environment* component in the *Essential Components of Physical Education* document. These data were also used to examine whether schools implementing specific physical education policies varied by school characteristics. Finally, this study also explored the number of physical education policies that are being implemented by schools and if that number differed by school characteristics.

METHODS

Participants

The School Health Policies and Practices Study (SHPPS) is a national survey periodically conducted by the US Centers for Disease Control and Prevention (CDC) to assess school health policies and practices at the state, district, school, and classroom levels. The current study used school-level data gathered between February and June 2014. A detailed description of SHPPS methods has been published previously.³ Briefly, a 2-stage sample design was used to select a nationally representative sample of elementary, middle, and high schools. All public and private schools in the US with any of grades kindergarten through 12 were eligible for sampling.

Instrumentation

Respondents to the physical education and activity questionnaire were asked a series of questions related to physical education requirements at the school. About 81% of them were physical education teachers. Table 1 provides the questions from the SHPPS questionnaire that were used to align with the physical education policies identified in the *Essential Components of Physical Education* document.⁴

Physical education policies.—Three of the physical education policies—prohibit exemptions for physical education, prohibit use of physical activity as punishment, and prohibit withholding physical education as punishment—had yes/no response options. Schools that responded yes to each of these questions were considered as implementing the physical education policies.

The policy on requiring new staff who teach physical education to be certified, licensed, or endorsed by the state in physical education had 3 response options: yes, no, or state does not offer certification, licensure, or endorsement. Schools that responded yes were considered to be implementing this physical education policy. There were 2 questions about prohibiting

the withholding of physical education as punishment. The questions were combined, and schools that responded yes to both of these questions were considered as implementing this physical education policy.

The policy on prohibiting substitutions for physical education, such as band, chorus, or sports, for physical education class came from 7 separate questions in SHPPS, each with a yes/no response option. These response options were combined, so that schools that responded no to all the questions were considered as implementing this physical education policy (Table 1). Daily physical education was defined as physical education that occurred for at least 36 weeks (ie, a typical school year) per school year for at least 150 minutes per week in elementary schools and for at least 225 minutes per week in middle and high schools. Three questions from SHPPS about physical education classes and courses were combined and the number of weeks was multiplied by number of days and by number of minutes. Schools that offered daily physical education for the recommended minutes were considered to be implementing this physical education policy (Table 1).

From the 7 physical education policies, a count variable was created with a range from 0 (implementing none of the physical education policies) to 7 (implementing all the physical education policies).

School characteristics.—The SHPPS data file includes information about select school characteristics sourced from the National Center for Education Statistics. These variables included region (Northeast, Midwest, South, and West), metropolitan status (urban, suburban, and rural), school level (elementary, middle, and high), school type (public, nonpublic), and school enrollment size. School enrollment was categorized as small, medium, or large using slightly different cutoffs to achieve comparable frequencies across grade levels, accounting for differences in size by school level. Specifically, for elementary and middle schools, cutoffs were 300, 301–500, and > 500, for small, medium, and large schools, respectively, and for high schools, cutoffs were 350, 351–800, and > 800. 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 3 groups: <40%, 40% to <75%, and 75%. The 40% cutoff was chosen to align with the school-level threshold for the Community Eligibility Provision.¹⁷ The National Center for Education Statistics uses 75% eligibility to identify high poverty schools.¹⁸

Procedure

Trained interviewers visited each participating school to conduct computer-assisted personal interviews. Seven school-level questionnaires were administered in each school. The principal or other school contact identified the most knowledgeable respondent for each questionnaire. This analysis used data gathered from the physical education and activity questionnaire (N = 582, response rate = 70%).

Data Analysis

Statistical analyses were conducted on weighted data using SAS callable SUDAAN version 11.0.1 to account for the complex sample design. First, prevalence estimates were calculated with 95% confidence intervals for each physical education policy. Next, bivariate analyses were conducted to identify significant differences in prevalence estimates for physical education policies by school characteristics. Results were considered statistically significant if $p < .05$. In addition, for school characteristics with more than 2 categories, pairwise t tests were conducted to determine which categories were significantly different from each other. Finally, a Poisson regression model was used to estimate the strength of associations between the number of physical education policies implemented in schools and school characteristics. If schools were missing any school characteristic data, they were dropped from the Poisson regression model. Schools that had any missing data from the physical education policy data were not dropped from the model.

RESULTS

Table 2 shows the percentage of schools that have implemented each physical education policy identified in the *Essential Components of Physical Education* document overall and by school characteristics. Overall, more than 75% of schools prohibit substitution of other activities for physical education. Also, 75.4% of schools required new staff who teach physical education to be certified, licensed, or endorsed by the state. More than half of schools prohibited physical activity to be assigned (52.5%) or physical education to be withheld (67.4%) as punishment. More than 40% of schools had a maximum student-to-teacher ratio requirement for physical education, and 24.0% of schools prohibited exemptions for physical education. Overall, 4% of schools provided daily physical education that met the recommended amount of time for physical education per week for elementary and secondary schools throughout the school year.

By region, significant differences were found for 5 of the 7 physical education policies. Based on the findings of the pairwise t tests, a higher percentage of schools in the Northeast than in the South and West prohibited substitutions. The Northeast also had the highest percentage that prohibited the use of physical activity as punishment, whereas the Midwest had a lower percentage of schools with a maximum student-to-teacher ratio requirement for physical education than schools in the South and West, and the West had a lower percentage of schools requiring certified, licensed, or endorsed physical education teachers than did the Midwest and South.

Prohibiting use of physical activity as punishment and requiring certified, licensed, or endorsed physical education teachers differed by metropolitan status. A lower percentage of rural schools than suburban and urban schools prohibited use of physical activity as punishment, whereas a higher percentage of rural than urban schools required certified, licensed, or endorsed physical education teachers.

Three of the physical education policies varied significantly by school level—the percentage of schools having a maximum student-to-teacher ratio requirement for physical education and prohibiting withholding physical education as punishment was lower among middle

schools than elementary and high schools, whereas the percentage of schools prohibiting substitutions for physical education was lower among high schools than elementary and middle schools. For school type, school enrollment, and percentage of non-Hispanic white students, there was a significant difference found for requiring certified, licensed, or endorsed physical education teachers. Public schools, larger schools, and schools with 50% or more non-Hispanic white students were each more likely to have this policy. Prohibiting exemptions for physical education had a lower percentage among schools that reported 75% of students eligible for free or reduced-price lunch than schools with <75% eligible, and prohibiting withholding physical education as punishment had a higher percentage among schools that reported between 40% and <75% of students eligible than among schools with <40% eligible.

A count variable was created to assess the number of physical education policies schools were implementing. This analysis showed that 3.4% of schools were not implementing any of the physical education policies, 12.4% of schools were implementing 1 policy, 23.2% were implementing 2, 26.1% were implementing 3, 17.4% were implementing 4, 13.9% were implementing 5, 3.4% were implementing 6, and 0.2% were implementing all 7. The average number of physical education policies implemented by schools was 3.0. To examine how the number of physical education policies varied by school characteristics a Poisson regression model was used (Table 3). Of the 7 school characteristics examined, 2 were significantly associated with the number of physical education policies implemented. Compared to rural schools, the number of physical education policies implemented for urban schools increased by 0.18. In addition, compared to high schools, the number of physical education policies implemented for elementary and middle schools decreased by -0.12 and -0.21, respectively. Across the remaining school characteristics, the number of physical education policies being implemented by schools did not vary significantly. Because this count variable had a relatively normal distribution, this analysis was repeated using a linear regression model, which produced the same significant findings.

DISCUSSION

The 2016 United States Report Card on Physical Activity in Children and Youth highlighted that the majority of children and youth do not meet the national recommendation for daily physical activity.¹⁹ Physical education has been shown to be an effective way to increase physical activity among all students.^{1,4,20} To our knowledge, no previous studies have examined physical education policies as stated in the *Essential Components of Physical Education* document among a nationally representative sample of elementary, middle, and high schools, by school characteristics. The findings of this study suggest that many elementary, middle, and high schools across the United States are not implementing essential physical education policies to ensure effective physical education programs. The results also revealed that both the implementation of specific physical education policies and the number of physical education policies vary by school characteristics. Examining physical education policies in these 2 ways sheds light on the need to increase physical education policies in schools. These results also provide a better understanding of which policies need to be implemented to support increased physical education and physical activity for students in kindergarten through 12th grade.

More than 65% of schools implemented between 2 and 4 of the 7 essential physical education policies examined in this study. However, there was wide variability across the specific physical education policies implemented. Specifically, a majority of schools (>50%) implemented physical education policies prohibiting substitutions for physical education, prohibiting withholding physical education as punishment, prohibiting use of physical activity as punishment, and requiring physical education teachers to be certified, licensed, or endorsed. Many of these policies have not improved since the 2000 SHPPS, except for increases in the percentage of middle and high schools requiring physical education teachers to be certified, licensed, or endorsed, with a percentage point difference of 10% and 13%, respectively.³ However, a lower percentage of schools implemented policies on providing daily physical education, having a maximum class size, and prohibiting exemptions for physical education. These 3 policies need the most improvement, although all of the identified physical education policies are essential and should be in place at the state, district, and school level. These findings are echoed in the recent Shape of the Nation report, which found that few states have many of these policies in place. This lack of state policy support provides a possible explanation as to why schools might not be adopting and implementing these policies.^{7,21} Future studies are needed to better understand the impact of state and district physical education policies on the interpretation, adoption, and implementation of these policies at the school level.

Five of the physical education policies varied by region. Two of the significant findings for region showed the Northeast had the highest percentage, but in general, there were not any consistent patterns. These differences might be a result of states having local control or site-based management.

Another interesting finding was that requiring certified, licensed, or endorsed physical education teachers varied by all of the school characteristics, except for school level and students eligible for free or reduced-price lunch. It is encouraging that all school levels seem to have placed this as a priority, as this also has been a recommended policy that national organizations have made for many years.^{1,7} Previous studies have shown that certified physical education teachers teach longer lessons, impart more knowledge, and provide more moderate and vigorous physical activity than do teachers with little or no specialized training in physical education.^{1,22} Additionally, it is reassuring that quality instruction by trained teachers may not be compromised by schools that have fewer resources.

In the analysis of the number of physical education policies, urban schools were shown to be implementing a higher number of policies compared to rural schools. This supports national efforts of targeting urban school districts for physical education.²³ It also highlights a critical need to better understand the support and delivery system of physical education policies in rural schools.

Differences by school level also were significant, with high schools implementing a higher number of policies compared to elementary and middle schools. This finding, however, does not mean that high school students participate in more physical education. In fact, in a recent trend analysis, the number of high school students reporting daily physical education attendance decreased significantly from 42% in 1991 to 25% in 1995, then did not change

through 2015.^{24,25} One explanation for this discrepancy is that course requirements often vary across school levels. For example, in many middle and high schools, students may only be required to take physical education for 1 semester or take only 1 course to move to the next grade or graduate. Further understanding of this discrepancy is necessary to ensure students benefit from the physical education policies established at schools.

More research is needed to better understand the differences identified in this study to help improve physical education programs that will hopefully give students the knowledge and skills to be physically active. This study examined only 1 component of the *Essential Components of Physical Education* document. Future studies need to examine the other components and their collective impact on effective physical education programs.

Limitations

This study has several limitations that must be acknowledged. First, SHPPS data are self-reported and therefore the extent of underreporting or over reporting of physical education policies could not be determined. Second, the data are cross-sectional, which means that causality of associations between school characteristics and physical education policies is unclear. Third, although results were weighted to adjust for nonresponse, differences between responding schools and nonresponding schools were not examined and could potentially bias the results. Finally, the policies listed in the *Essential Components of Physical Education* document were not a perfect match to the questions used from SHPPS. Specifically, SHPPS did not assess whether physical education class size is consistent with that of other subject areas and aligns with school district and school teacher/student ratio policies. The measure included in this study only assessed whether schools set a maximum student-teacher ratio. Also, SHPPS only assessed if newly hired staff who taught physical education were required to be certified, licensed, or endorsed by the state to teach physical education, rather than assessing this for all staff who taught physical education. In addition, 2 of the policies listed for the component on policy and environment were not included in the analysis, see footnotes in Table 1.

Conclusions

Despite national guidance and clear objectives outlined in Healthy People 2020 to increase the proportion of schools that require daily physical education, this study reveals that many schools are not implementing essential physical education policies. There are potential actions that can be taken to increase these policies. In addition, public health and education professionals can use these results when working with policy-makers to implement these essential physical education policies, especially among rural and elementary and middle schools. In addition, targeted professional development and technical assistance can be used to strengthen and increase the prevalence of these policies, which in turn, will potentially enhance physical education programs.

Acknowledgments

The findings and conclusions in this manuscript are those of the authors and do not necessarily represent the official position of the US Centers for Disease Control and Prevention.

REFERENCES

1. US Centers for Disease Control and Prevention. School health guidelines to promote healthy eating and physical activity. *MMWR Morb Mortal Wkly Rep.* 2011;60(RR-5):1–76.
2. Institute of Medicine. *Educating the Student Body: Taking Physical Activity and Physical Education to School.* Washington, DC: National Academy of Sciences; 2013 Available at: http://books.nap.edu/openbook.php?record_id=18314&page=R1. Accessed June 6, 2018.
3. US Centers for Disease Control and Prevention. *Results from the School Health Policies and Practices Study 2014.* Atlanta, GA: US Department of Health and Human Services; 2015.
4. SHAPE America. *The Essential Components of Physical Education.* Reston, VA: SHAPE America—Society of Health and Physical Educators; 2015 Available at: <http://www.shapeamerica.org/upload/TheEssentialComponentsOfPhysicalEducation.pdf>. Accessed June 6, 2018.
5. US Centers for Disease Control and Prevention. *The Association between School-based Physical Activity, Including Physical Education, and Academic Performance.* Atlanta, GA: US Department of Health and Human Services; 2010.
6. Michael SL, Merlo C, Basch C, Wentzel KR, Wechsler H. Critical connections: health and academics. *J Sch Health.* 2015;85(11):740–758. [PubMed: 26440816]
7. SHAPE America, American Heart Association. *Shape of the Nation: Status of Physical Education in the USA.* Reston, VA: SHAPE America—Society of Health and Physical Educators; 2016 Available at: http://www.shapeamerica.org/advocacy/son/2016/upload/Shape-of-the-Nation-2016_web.pdf. Accessed June 6, 2018.
8. Piekarz E, Schermbeck R, Young SK, Leider J, Ziemann M, Chriqui JF. *School District Wellness Policies: Evaluating Progress and Potential for Improving Children’s Health Eight Years after the Federal Mandate, School Years 2006–07 through 2013–14.* Chicago, IL: Bridging the Gap Program and National Wellness Policy Study, Institute for Health Research and Policy; 2016 Available at: <https://www.ihrp.uic.edu/files/District-Monograph-1Jul16-norw.pdf>. Accessed June 6, 2018.
9. Piekarz-Porter E, Chriqui JF, Schermbeck RM, Leider J, Lin W. *The Active Role States Have Played in Helping to Transform the School Wellness Environment through Policy, School Years 2006–07 through 2014–15.* Chicago, IL: Bridging the Gap Program and National Wellness Policy Study, Institute for Health Research and Policy; 2017 Available at: https://www.ihrp.uic.edu/files/NWPS_State_Report_508.pdf. Accessed June 6, 2018.
10. Piekarz-Porter E, Schermbeck RM, Leider J, Young SK, Chriqui JF. *Working on Wellness: How Aligned Are District Wellness Policies with the Soon-To-Be Implemented Federal Wellness Policy Requirements? Nationwide Baseline Information from the 2014–15 School Year.* Chicago, IL: National Wellness Policy Study, Institute for Health Research and Policy; 2017 Available at: https://www.ihrp.uic.edu/files/NWPS_Wkg_on_wellness_508v3.pdf. Accessed June 6, 2018.
11. Slater SJ, Nicholson V, Chriqui J, Turner L, Chaloupka F. The impact of state laws and district policies on physical education and recess practices in a nationally representative sample of US public elementary schools. *Arch Pediatr Adolesc Med.* 2012;166(4):311–316. [PubMed: 22147763]
12. Lounsbury MAF, McKenzie TL, Morrow JR, Monnat SM, Holt KA. District and school physical education policies: implications for physical education and recess time. *Ann Behav Med.* 2013;5(1):S131–S141.
13. Lafleur M, Strongin S, Cole BL, et al. Physical education and student activity: evaluating implementation of a new policy in Los Angeles public schools. *Ann Behav Med.* 2013;45(1):S122–S130. [PubMed: 23334762]
14. Oh AY, Hennessy E, McSpadden KE, Perna FM. Contextual influences on weight status among impoverished adolescents: neighborhood amenities for physical activity and state laws for physical education time requirements. *J Phys Act Health.* 2015;12(6):875–878. [PubMed: 25109235]
15. Ward DS. *School Policies on Physical Education and Physical Activity.* San Diego, CA: Active Living Research; 2013 Available at: http://activelivingresearch.org/sites/default/files/Synthesis_Ward_SchoolPolicies_Oct2011_1.pdf. Accessed June 6, 2018.
16. Bassett DR, Fitzhugh EC, Heath GW, et al. Estimated energy expenditures for school-based policies and active living. *Am J Prev Med.* 2013;44(2):108–113. [PubMed: 23332325]

17. US Department of Agriculture. The Community Eligibility Provision (CEP): What Does It Mean for your School or Local Educational Agency. Washington, DC: US Department of Agriculture; 2015 Available at: <https://www.fns.usda.gov/sites/default/files/cn/CEPfactsheet.pdf>. Accessed June 6, 2018.
18. National Center for Educational Statistics. Free or Reduced Priced Lunch: A Proxy for Poverty? Washington, DC: Institute of Educational Sciences; 2015 Available at: <https://nces.ed.gov/blogs/nces/post/free-or-reduced-price-lunch-a-proxy-for-poverty>. Accessed June 6, 2018.
19. National Physical Activity Plan Alliance. The 2018 United States Report Card on Physical Activity for Children and Youth. Washington, DC: National Physical Activity Plan Alliance, 2018. http://physicalactivityplan.org/projects/PA/2018/2018_USReportCard_UPDATE_12062018.pdf?pdf=page-link. Accessed June 6, 2018.
20. Mooses K, Pihu M, Riso E, Hannus A, Kaasik P, Kull M. Physical education increases daily moderate to vigorous physical activity and reduces sedentary time. *J Sch Health*. 2017;87(8): 602–607. [PubMed: 28691172]
21. Snelling A, Belson SI, Watts E, Malloy E, Van Dyke H, George S. Measuring the implementation of a school wellness policy. *J Sch Health*. 2017;87(10):760–768. [PubMed: 28876481]
22. Davis K, Burgeson CR, Brener ND, McManus T, Wechsler H. The relationship between qualified personnel and self-reported implementation of recommended physical education practices and programs in U.S. schools. *Res Q Exerc Sport*. 2005;76: 202–211. [PubMed: 16128487]
23. Sliwa S, Nihiser A, Lee S, McCaughtry N, Culp B, Michael S. Engaging students in physical education: key challenges and opportunities for PE teachers in urban settings. *J Phys Educ Recreat Dance*. 2017;88(3):43–48. [PubMed: 28736480]
24. National Physical Activity Plan Alliance. Secular Changes in Physical Education Attendance Among US High School Students, YRBS 1991–2013. Columbia, SC: US Centers for Disease Control and National Physical Activity Plan Alliance; 2016 Available at: https://www.cdc.gov/healthyschools/physicalactivity/pdf/Secular_Trends_PE_508.pdf. Accessed June 6, 2018.
25. Kann L, McManus T, Harris WA, et al. Youth risk behavior surveillance— United States, 2015. *MMWR Morb Mortal Wkly Rep*. 2016;65(6):1–174. [PubMed: 26766396]
26. US Centers for Disease Control and Prevention. Putting Local School Wellness Policies Into Action. Atlanta, GA: US Department of Health and Human Services; 2014 Available at <http://www.cdc.gov/healthyschools/npao/pdf/SchoolWellnessInAction.pdf>. Accessed June 6, 2018.
27. US Centers for Disease Control and Prevention. Increasing Physical Education and Physical Activity: A Framework for Schools. Atlanta, GA: US Department of Health and Human Services; 2017 Available at https://www.cdc.gov/healthyschools/physicalactivity/pdf/17_278143-A_PE-PA-Framework_508.pdf. Accessed June 6, 2018.
28. SHAPE America. Guide for Physical Education Policy. Reston, VA: SHAPE America—Society of Health and Physical Educators; 2014 Available at: <http://www.shapeamerica.org/advocacy/upload/Guide-for-Physical-Education-Policy-9-23-14.pdf>. Accessed June 6, 2018.

IMPLICATIONS FOR SCHOOL HEALTH

The findings from this study suggest many schools are only implementing a few of the physical education policies that can strengthen their physical education programs. Below are specific actions that schools can take to ensure physical education policies are being adopted and implemented.

- Identify school staff, such as the physical education teacher, to participate in the development, implementation, and update of the local school wellness policy and ensure that the policy includes physical education. Schools within states and districts that have policies for physical education are more likely to implement evidence-based practices that align with those policies.^{2,15}
- Have a school wellness or school health team that facilitates the implementation of the local wellness policies at the school building level and works with school leadership to incorporate physical education into the school improvement plan.²⁶ Recent studies show the positive impact of school-based physical activity, with physical education as the foundation, on student behavior and learning and the overall school climate.^{6,27}
- Use key resources such as SHAPE America's Guide for Physical Education Policy and the Essential Components of Physical Education document to help school leaders and practitioners identify policies that need to be in place for physical education.^{4,28} These practical resources also can be used to address weaknesses identified in CDC's School Health Index, which provides a comprehensive assessment of school health policies and practices for schools.
- Provide professional development and technical assistance for physical education teachers on state, district, and school level physical education policies and how these policies can be implemented at the classroom level. This also can empower physical education teachers and other school staff to learn about and analyze the strength of existing physical education policies so that they could be advocates for strong physical education policies at the state, district, and school levels and ensure implementation of these policies.

In addition to schools, these findings can be used by federal agencies, national nongovernmental organizations, and states to develop targeted training, technical assistance, and resources on physical education policy for school districts and schools. These actions will help address the national goal of providing daily physical education to all students, and ultimately, help students achieve the national recommendation for them to be physically active for at least 60 minutes every day.

Table 1.

Description of Physical Education Policies and Variables Used From the School Health Policies and Practices Study (SHPPS)— United States, 2014

Short-hand title for physical education policies	Physical education policies as stated in the essential components for physical education [†]	School-level variables used to measure physical education policies from the School Health Policies and Practices Study [‡]
Require daily PE	Require daily physical education in grades K-12, with instruction periods totaling 150minutes per week in elementary and 225minutes per week in middle and high school.	Three questions about physical education: <ul style="list-style-type: none"> • At your school, in which grades do students receive required instruction in physical education? • Are students at your school required to take specific courses that include instruction in physical education? • Are there any courses at your school that students must choose from to meet this type of general physical education requirement? For each of these 3 questions, the following information was collected: <ul style="list-style-type: none"> • Number of weeks during the school year students are scheduled to take physical education. • Number of days per week students are scheduled to take physical education • Number of minutes each session of physical education was scheduled to last.
Prohibit substitutions for PE	Prohibit students from substituting other activities (eg, JROTC, interscholastic sports) for physical education class.	Can students at your school be exempted for: <ul style="list-style-type: none"> • Participation in school activities other than sports, such as band or chorus? • Participation in school activities other than sports, such as band, chorus, or JROTC? • Participation in community sports activities? • Participation in community service activities? • Enrollment in other courses, such as math or science? • Participation in school sports? • Participation in vocational training?
Prohibit exemptions for PE	Prohibit student exemptions from physical education class time or credit requirements.	Does your school prohibit exemptions from physical education requirements for 1 grading period or longer?
Prohibit withholding PE as punishment	Prohibit physical activity to be withheld as punishment.	<ul style="list-style-type: none"> • Are staffs at your school prohibited or actively discouraged from excluding students from all or part of physical education as punishment for bad behavior in physical education? • Are staffs at your school prohibited or actively discouraged from excluding students from all or part of physical education to punish them for bad behavior or failure to complete class work in another class?
Prohibit use of PA as punishment	Prohibit physical activity to be assigned as punishment.	Are staff at your school prohibited or actively discouraged from using physical activity, such as laps or push-ups, to punish students for bad behavior in physical education?
Have maximum class size	Ensure physical education class size is consistent with that of other subject areas.	Is there a maximum student-to-teacher ratio allowed for required physical education at your school?
Require certification, licensure, or endorsement for PE teacher	Ensure physical education is taught by a state licensed or state-certified teacher who is endorsed to teach physical education.	Are newly hired staff who teach physical education required to be certified, licensed, or endorsed by the state in physical education?

PA, physical activity; PE, physical education.

[†]These statements came from the Essential Components of Physical Education document developed by SHAPE America. The following 2 physical education policies “Do not allow waivers from physical education class time or credit requirements” and “Require full inclusion of all students in physical education” were not included in this study because they did not match questions in SHPPS.

[‡]The SHPPS question for this analysis can be found in the Physical Education and Activity School Questionnaire at www.cdc.gov/healthyouth/data/shpps/files/questionnaires/physedl2014questionnaire.pdf.

Table 2.

Percentage of Schools Implementing Physical Education Policies by School Characteristics, School Health Policies and Practices Study— United States, 2014

School characteristic	Physical education policies [†]						
	Require daily PE % (95% CI)	Prohibit substitutions for PE % (95% CI)	Prohibit exemptions for PE % (95% CI)	Prohibit withholding PE as punishment % (95% CI)	Prohibit use of PA as punishment % (95% CI)	Have maximum class size % (95% CI)	Require certification, licensure, or endorsement for PE teacher % (95% CI)
Sample size, N [‡]	582	429	437	565	568	445	562
Overall percentage [§]	3.7 (2.3–5.9)	76.2 (71.7–80.2)	24.0 (19.5–29.1)	52.5 (47.5–57.4)	67.4 (63.1–71.5)	42.4 (36.5–48.5)	75.4 (70.0–80.1)
Region							
Northeast	0.5 (0.1–3.7)	88.4 [†] (75.9–94.8)	29.5 (20.5–40.3)	59.8 (47.0–71.5)	84.2 [†] (75.7–90.1)	40.2 (29.0–52.5)	69.9 (56.0–80.9)
Midwest	3.8 (1.6–8.9)	77.9 (69.4–84.6)	16.8 (10.6–25.5)	44.7 (35.6–54.2)	63.6 (53.9–72.3)	28.5 [#] (19.7–39.3)	87.4 ^{††} (79.0–92.7)
South	6.2 (3.2–11.6)	69.5 (61.7–76.4)	23.4 (15.8–33.1)	56.9 (48.7–64.6)	62.8 (54.9–70.0)	45.7 (37.2–54.6)	84.1 (75.5–90.0)
West	2.6 (0.9–7.9)	72.4 (62.4–80.6)	28.0 (17.9–41.0)	49.1 (39.8–58.5)	64.4 (56.2–71.9)	55.5 (40.5–69.6)	55.9 ^{‡‡} (43.3–67.9)
p value	0.04 ^{***}	0.02 [*]	0.2	0.1	0.01 [*]	0.02 [*]	0.000 ^{***}
Metro status							
Urban	4.5 (2.0–10.1)	78.7 (71.4–84.6)	22.7 (15.0–32.7)	52.8 (43.3–62.0)	72.0 (64.8–78.3)	46.6 (35.5–58.1)	62.0 (50.4–72.3)
Suburban	2.3 (0.8–7.0)	78.4 (69.1–85.5)	21.9 (14.4–31.9)	53.5 (45.1–61.8)	76.6 (68.6–83.0)	45.7 (35.7–56.0)	75.9 (65.5–83.9)
Rural	4.0 (2.0–7.7)	72.0 (63.9–78.9)	26.8 (20.0–35.0)	51.4 (43.6–59.2)	56.4 ^{////} (48.8–63.8)	35.7 (27.2–45.3)	86.2 ^{†††} (79.7–90.9)
p value	0.5	0.4	0.6	0.9	0.001 ^{***}	0.2	0.001 ^{***}
School level							
Elementary	3.6 (1.8–7.4)	88.0 (80.6–92.8)	20.4 (13.7–29.3)	56.8 (49.4–63.9)	72.0 (65.4–77.8)	46.5 (36.8–56.5)	74.6 (66.9–81.1)
Middle	3.5 (1.4–8.5)	77.0 ^{###} (69.0–83.5)	22.8 (16.5–30.6)	42.3 ^{†††} (35.2–49.8)	63.9 (56.1–71.1)	28.4 ^{†††} (20.9–37.2)	74.2 (66.2–80.9)
High	4.0 (1.8–8.8)	54.5 ^{††††} (45.1–63.6)	31.2 (23.8–39.7)	54.7 (46.6–62.6)	60.4 (52.3–68.0)	49.8 (40.5–59.2)	78.9 (70.7–85.3)
p value	1.0	0.000 ^{***}	0.1	0.01 [*]	0.06	0.002 ^{**}	0.6
School type							
Public	4.0 (1.1–2.3)	73.9 (68.7–78.5)	23.6 (18.7–29.3)	53.8 (48.6–58.9)	66.7 (62.1–71.0)	45.2 (38.6–52.0)	87.2 (82.7–90.7)
Nonpublic	2.7 (0.9–8.1)	82.3 (71.8–89.5)	25.0 (15.3–38.1)	48.2 (36.2–60.5)	70.0 (59.5–78.7)	35.0 (23.2–49.0)	35.8 (25.0–48.4)
p value	0.5	0.1	0.8	0.4	0.5	0.2	0.000 ^{***}
School enrollment ^{§§§}							

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School characteristic	Physical education policies [†]						
	Require daily PE % (95% CI)	Prohibit substitutions for PE % (95% CI)	Prohibit exemptions for PE % (95% CI)	Prohibit withholding PE as punishment % (95% CI)	Prohibit use of PA as punishment % (95% CI)	Have maximum class size % (95% CI)	Require certification, licensure, or endorsement for PE teacher % (95% CI)
Small	3.5 (1.9–6.6)	75.5 (66.9–82.5)	26.2 (19.2–34.7)	50.6 (42.1–59.0)	63.8 (55.8–71.1)	34.7 (26.2–44.3)	65.1 ^{//////} (56.4–72.9)
Medium	1.6 (0.6–4.6)	77.7 (69.4–84.3)	23.1 (15.8–32.6)	55.2 (45.9–64.2)	66.7 (58.0–74.4)	44.7 (33.8–56.1)	80.8 (71.5–87.5)
Large	5.5 (2.6–11.1)	75.9 (68.5–81.9)	21.9 (14.9–31.0)	52.6 (45.3–59.8)	72.6 (65.7–78.5)	50.7 (40.8–60.5)	83.6 (75.8–89.3)
p value	0.09	0.9	0.7	0.8	0.2	0.06	0.003 ^{**}
Percentage of non-Hispanic white students							
50%	6.9 (3.3–13.7)	71.0 (61.5–79.0)	22.0 (13.3–34.0)	57.7 (47.6–67.2)	68.5 (60.1–75.9)	51.1 (39.3–62.7)	78.2 (67.9–85.7)
>50%	3.2 (1.4–6.9)	76.8 (70.4–82.1)	22.5 (16.8–29.5)	49.7 (43.0–56.3)	66.7 (60.7–72.3)	42.9 (34.7–51.5)	93.2 (88.5–96.0)
p value	0.2	0.3	0.9	0.2	0.7	0.3	0.003 ^{**}
Percentage of students eligible for free or reduced-priced lunch							
<40	4.7 (2.1–10.2)	77.0 (68.9–83.5)	25.6 (18.4–34.3)	44.5 (37.2–52.1)	70.7 (62.7–77.6)	43.2 (33.8–53.1)	92.0 (85.1–95.9)
40 to <75	5.2 (2.3–11.5)	67.5 (58.3–75.4)	26.9 (18.2–38.0)	59.3 ^{###} (50.8–67.4)	65.5 (58.1–72.2)	50.5 (39.8–61.1)	85.3 (76.9–90.6)
75	2.9 (0.8–10.3)	82.3 (69.4–90.5)	10.0 ^{###} (4.9–19.3)	57.5 (45.2–69.0)	65.2 (53.6–75.3)	46.3 (32.6–60.7)	84.8 (72.0–92.3)
p value	0.7	0.09	0.01 [*]	0.02 [*]	0.6	0.6	0.3

CI, confidence interval; PA, physical activity, PE, physical education.

* p .05;

** p .01;

*** p .001.

[†]The physical education policies are based on the Essential Components of Physical Education. See Table 1 for a full description of each component and SHPPS variable(s) used.

[‡]Number of observations for that physical education policy.

[§]Overall percentage of schools implementing that physical education policy.

// Indicates that pairwise *t* test for differences between South and West vs Northeast is significant at *p* < .05.

/// Indicates that pairwise *t* test for differences between Midwest, South, West vs Northeast is significant at *p* .05.

Indicates that pairwise *t* test for differences between South and West vs Midwest is significant at *p* .05.

†† Indicates that pairwise *t* test for Northeast vs Midwest is significant at *p* .05.

††† Indicates that pairwise *t* test for differences between Midwest and South vs West is significant at *p* .05.

§§ Unable to run pairwise t test due to small cell size across the different regions for this physical education policy.

//// Indicates that pairwise t test for differences between urban and suburban vs rural is significant at $p = .05$.

“” Indicates that pairwise t test for urban vs rural is significant at $p = .05$.

Indicates that pairwise t test for elementary vs middle schools is significant at $p = .05$.

††† Indicates that pairwise t test for differences between elementary and high schools vs middle schools is significant at $p = .05$.

†††† Indicates that pairwise t test for differences between elementary and middle schools vs high schools is significant at $p = .05$.

§§§ Elementary and middle schools had the same cutoffs (< 300 , $301-500$, and >500) and high schools had different cutoffs (350 , $351-800$, and >800) to achieve comparable frequencies of small, medium, and large schools across grade levels.

//// Indicates that pairwise t test for differences between large and medium vs small enrolled schools is significant at $p = .05$.

“” Indicates that pairwise t test for <40 vs 40 to <75 of students eligible for free or reduced-priced lunch is significant at $p = .05$.

Indicates that pairwise t test for differences between <40 and 40 to <75 vs 75 of students eligible for free or reduced-priced lunch is significant at $p = .05$.

Table 3.

Poisson Regression Model for Number of Physical Education Policies by School Characteristics, School Health Policies and Practices Study (SHPPS)— United States, 2014

School characteristic [†]	Number of physical education policies [‡] β (SE)	p-value [§]
Region		
Northeast	0.16 (0.10)	0.08
Midwest	0.07 (0.08)	0.36
South	0.08 (0.08)	0.33
West	Ref	
Metro status		
Urban	0.18 (0.07)	0.01*
Suburban	0.06 (0.06)	0.27
Rural	Ref	
School level		
Elementary	-0.12 (0.05)	0.03*
Middle	-0.21 (0.07)	0.002**
High	Ref	
School enrollment [§]		
Small	-0.01 (0.06)	0.82
Medium	-0.04 (0.06)	0.43
Large	Ref	
Percentage of non-Hispanic white students		
50%	-0.03 (0.06)	0.61
>50%	Ref	
Percentage of students eligible for free or reduced-priced lunch		
<40	0.08 (0.08)	0.37
40<75	0.04 (0.07)	0.58
75	Ref	

* p .05;

** p .01;

*** p .001.

β , beta coefficient; N = 416; Ref, referent group; SE, standard error.

[†]Because the model was fully saturated when all the school characteristic variables were included, school type was not included in this model based on the findings from Table 2 and that the majority of schools included in this analysis were from public schools. However, school type was included initially in the model and taking out this variable did not change the significant findings or affect the beta estimates.

[‡]Number of physical education policies was the dependent variable with a range of 0–7.

[§]Elementary and middle schools had the same cutoffs (< 300, 301–500, and > 500) and high schools had different cutoffs (< 350, 351–800, and >800) to achieve comparable frequencies of small, medium, and large schools across grade levels.