Examination of Trends and Evidence-Based Elements in State Physical Education Legislation: A Content Analysis

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ABSTRACT

OBJECTIVES: To develop a comprehensive inventory of state physical education (PE) legislation, examine trends in bill introduction, and compare bill factors.

METHODS: State PE legislation from January 2001 to July 2007 was identified using a legislative database. Analysis included components of evidence-based school PE from the Community Guide and other authoritative sources: minutes in PE, PE activity, teacher certification, and an environmental element, including facilities and equipment. Researchers abstracted information from each bill and a composite list was developed.

RESULTS: In total, 781 bills were analyzed with 162 enacted. Of the 272 bills that contained at least 1 evidence-based element, 43 were enacted. Only 4 bills included all 4 evidence-based elements. Of these 4, 1 was enacted. Funding was mentioned in 175 of the bills introduced (37 enacted) and an evaluation component was present in 172 of the bills (49 enacted).

CONCLUSIONS: Based on this analysis, we showed that PE is frequently introduced, yet the proportion of bills with evidence-based elements is low. Future research is needed to provide the types of evidence required for development of quality PE legislation.

Keywords: physical education; physical activity; policy; evidence-based legislation; schools.

Policies can improve health by initiating changes in physical, economic, or social environments. Policies can also be a type of intervention that can significantly affect health over the long term. At present, there is a growing consensus that policy-based approaches targeting the school environment, such as physical education (PE), may have the greatest level of impact on childhood obesity. Introducing children to lifelong concepts of exercise and wellness through PE programs may not only improve current health status, but also help children learn to enjoy the benefits of a physically active lifestyle that can be transferred to adulthood. A systematic review of published studies, conducted on behalf of the Task Force on Community Preventive Service, found that PE is effective in improving both physical activity levels and physical fitness among school-aged children.

The importance of PE is also noted in national health-related goals. Healthy People 2010 includes the following 3 objectives relating to PE: to increase the proportion of schools that require daily PE, to increase the proportion of students who participate in daily PE, and to increase the proportion of adolescents who spend at least half of their PE time doing physical activities. Despite the potential benefits of PE for youth, federal and state mandates on academic accountability and financial stress in school budgets are contributing to a decrease in or elimination of PE programs. According to a report by the Center on Education Policy, 46% of school districts report an increase in time spent on English/Language Arts and Math but a concurrent decrease in PE by 25 to 49 minutes per week. A recent analysis of school policy data showed that many schools have PE programs, but few provide daily PE and many do not specify weekly time requirements.

States have a unique opportunity to influence PE in schools. State education departments may give local control over many issues to schools or districts, but state mandates are often issued for curriculum standards, federal requirements, or special topics. For example, the US Department of Agriculture (USDA) Child Nutrition and WIC (Women, Infants, and Children) Reauthorization Act of 2004 (Public Law 108-265) requires school districts to create wellness policies. States may set some general or minimum requirements for these policies, but individual school districts provide specific direction and may exceed the minimum recommendations.

Merely having a state policy is often not enough. The quality of the policy is also important. A key consideration in the development and passage of legislation is whether a particular policy is based on scientific evidence. Systematic reviews such as the Guide to Community Preventive Services allow researchers and policy makers to identify evidence-based policy. Yet in a systematic review of 107 “model” public health laws (ie, public health or private policy publicly recommended by at least 1 organization for adoption by government bodies or by specified private entities), Hartsfield and colleagues found no model laws focusing on promotion of physical education.

The objectives of this study were 3-fold: (1) to identify a comprehensive inventory of state PE legislation; (2) to compare and contrast the PE bills; and (3) to evaluate the PE bills on inclusion of evidence-based elements.

**METHODOLOGY**

This project was conducted by the Physical Activity Policy Research Network (PAPRN). The PAPRN, established in October 2004, is a thematic research network of the national Prevention Research Centers program that is supported by the Centers of Disease Control and Prevention. The goal of this network is to study policies that contribute to increasing physical activity in communities. In total, 10 universities are represented in the PAPRN and 8 of these contributed to this study.

**Policy Framework**

Key elements used as the basis of evaluating legislation were derived from the policy sciences framework. This framework views policy making as a “sequence of many actions by many actors, each with potentially different interests, information, roles, and perspectives.” Dimensions of the framework include the social process, problem orientation, and decision process. This article highlights the decision
process which refers to specific functions or activities of decision making. For example, the prescription function of the decision process includes the bills content, sanctions or penalties for noncompliance, and assets. Bill content is thoroughly outlined in our study by identification and assessment of bill elements. Compliance was measured by the inclusion of an oversight component and the specificity of the legislation. In this study, assets of a bill were measured in the presence or absence of a funding component. Other important elements of the prescription function of the decision process include the bills authority signal (Who sponsored it? Who enacted it?) and its control intent (the commitment to monitor and enforce compliance). These measures, combined with the measures of evidence-based PE elements allowed us to develop an abstraction guide that assesses the relative strength of different legislative proposals.

Abstraction Guide

The research team developed an abstraction guide for consistent content analysis. Categories for basic information included: sponsors, history, bill status, strength of language, oversight, evaluation, funding, and partners. Definitions of these terms are listed in Table 1. A separate section was devoted to PE standards. These standards were based on sample bills and national standards or categories from the National Association for Sport and Physical Education (NASPE). The abstraction guide went through several iterations and the final format was imported for online data entry. The form is available on the PAPRN Web site at (http://paprn.wustl.edu).

Bill (Data) Collection

With the help of legislative database consultants, the research team developed a complex search

| Table 1. Physical Education (PE) Legislation Abstraction Form Categorical Descriptions |
|----------------------------------------|-----------------------------------------------|
| Category                 | Description                                      |
| Sponsors                 | List of legislative sponsors or committees       |
| Status                   | Enacted or not enacted                           |
| History                  | Brief summary of legislative action              |
| Summary                  | Overview of content                              |
| Strength of language     | Was the bill required, encouraged, or recommended? |
| Category of bill         | Is the bill a general policy without guidance (eg, school policy) |
| Funding                  | Does the bill include provisions for funding and if so, what is the funding to be used for? |
| Other health issues      | Are their other health issues mentioned in the bill (eg, obesity)? |
| Oversight                | Does the bill mention who will oversee activities proposed? |
| Evaluation               | Will the activities in the bill be evaluated? If so, by whom? |
| Partners                 | Are their partners associated with the bill? If so, who? |

Selection of Evidence-Based Criteria

Evidence-based criteria were chosen based on research of effective interventions to increase physical activity in children. The first 2 evidence-based elements were an increase in minutes of PE and the inclusion of moderate or vigorous activity in PE class. The Guide to Community Preventive Services, a resource for evidence-based recommendations for programs and policies to promote population health, recommends an increase in moderate to vigorous activity in PE class. NASPE also provides guidance as to how much PE is adequate. NASPE recommendations include instructional periods totaling a minimum of 150 minutes per week for elementary students and 225 minutes per week for middle and secondary school. NASPE also recommends that students achieve and maintain a health-enhancing level of physical fitness which includes activities to improve cardiorespiratory endurance. The third evidence-based element was PE teacher certification or professional development. NASPE’s National Standards for Physical Education include a recommendation for qualified PE specialists.
teaching PE. NASPE acknowledges that highly qualified PE teachers will be certified to teach by virtue of having completed an accredited PE teacher education program. Requiring a degree in PE or ongoing professional development in PE is important to providing an effective PE program in schools. The last evidence-based element was environmental PE components including provisions for facilities and equipment. Numerous studies indicate that access to places for physical activity opportunities is an important aspect of increasing levels of activity. NASPE recommends a dedicated facility for the PE instructional program and has set standards for size, design, and amenities.

ANALYSIS

An online abstraction form was completed for each bill. Once all the bills were coded and entered into the online system, data was converted to a file for analysis. The bills were separated by coder and reviewed for any corrections or clarification of information needed. Once this second check was complete, the changes were made and the data put into an aggregate file.

Once the data file was organized, analysis was conducted using SPSS 15.0 statistical software. Basic frequencies and cross-tabulations for each element were computed. All analyses were conducted separately for federal and state bills. Evidence-based evaluation consisted of coding each bill with a point assigned for presence of each of the 4 evidence-based elements (score 0 = no evidence-based elements to 4 = all four evidence-based elements).

Reliability

Reliability analysis was conducted at 2 levels. First, to ensure comprehensive representation of bills in NETSCAN, a second legislative database was used (LexisNexis). A similar search term resulted in a list of bills compiled and cross referenced with the list of bills from NETSCAN. Overall, only 14 appropriate bills from the Lexis/Nexis search were not found in the NETSCAN search and were added to our list of bills for analysis. The second part of the reliability analysis consisted of an inter-rater reliability assessment. Every fifth bill was chosen for recoding from a chronological list of appropriate bills (n = 47/781). These bills were coded by 2 members of the research team. Results from both coders were compared by question topic areas. Bills in the reliability analysis were not coded for open-ended items such as bill summary, bill history, or bill partners. Overall percent agreement across the topic categories was 88%. Bill status (whether the bill was enacted) had 100% agreement and evaluation (whether the bill included an evaluation component) was the lowest (64%).

RESULTS

Patterns in State Bill Introduction and Enactment

A total of 781 bills were analyzed. The number of state bills introduced varied by year (Figure 1), with the lowest number of bills (54) introduced in 2002 and the highest number (193) in 2005. Four states (HI, MS, NJ, NY) had over 41 PE bills introduced during the study period of January 2001 to July 2007, with the majority of states having less than 10 bills introduced.

Figure 1. Number of PE Bills by Enacted Status and Inclusion of at Least 1 Evidence-Based Element Plotted by Year of Introduction
In total, 163 of the bills studied were enacted (defined as passed by both houses and signed by the governor). Two states (NM = 14, AK = 11) emerged as having the highest number of PE bills enacted over the 6.5-year period.

When examining the strength of language used in the bills, 692 of all state bills analyzed had wording that “required” the action. Of the bills enacted, 139 “required” action and 13 of the bills encouraged or recommended action. The strength of the language was unclear in 10 of the enacted bills. Of all bills introduced, 175 included some mention of funding, and of those enacted, 37 mentioned funding. Another aspect of the bills that was analyzed was appointment of oversight (who will oversee the bill action if enacted). Over 493 of the bills referred to individuals or entities that would make sure the components of the bill were put into action. Of the bills enacted, 117 included an oversight component. In addition to oversight, we identified whether or not bills included a provision for evaluation. Only 172 of bills introduced included means of evaluating the proposed actions in the bill, and 49 of bills enacted had an evaluation component. Another element for analysis was the mention of partners (governmental departments, state advisory groups, nonprofit organizations, etc). Of the bills introduced, 224 mentioned partners, whereas of the bills enacted, 50 included partners.

**PE Content Elements**

For all the bills introduced, the most frequent PE content element was minutes in PE (n = 178). The second most frequent element (n = 101) was other class curriculum changes (eg, health education) that involved some aspect of PE, followed by facilities/equipment (n = 78) and exemptions to PE (n = 74) (Table 2).

When comparing the PE content elements of bills by enactment, status rates varied. For example, of the bills introduced in the areas of types of activity in PE, 29 out of 178 were enacted, whereas 4 of the 15 bills recommending a specific program were enacted. In contrast, only 5 of the 148 bills that mentioned inclusions/adaptations and 8 of the 148 bills including facilities/equipment were enacted.

**Evidence-Based Elements**

Overall, 272 of the introduced bills contained at least 1 evidence-based element (Table 3). The number of bills with any evidence-based elements introduced ranged from 51 in 2005 to 16 in 2002. The number of bills introduced was inversely correlated with the number of evidence-based elements included. For example, of the 193 bills introduced in 2005, 38 bills contained at least 1 evidence-based element, 8 contained 2 elements, 4 contained 3 elements and only 1 bill contained all 4 evidence-based elements. Of the 272 bills that contained 1 or more evidence-based element, 43 were enacted (16%). For comparison, 23% or 119 of 509 bills that did not include evidence-based elements were enacted.

Comparing the evidence-based legislation by state, a regional pattern emerged. The states in the southern half of the United States introduced more evidence-based bills than the northern states. Eleven states had no evidence-based bills introduced, most of them located in the north central and northwest regions. Hawaii introduced the most bills (n = 57) that included at least 1 evidence-based element with Mississippi having introduced the second highest number (n = 25). Twenty-three states introduced 1 to 5 bills that included at least 1 evidence-based element.

When evidence-based bills were divided by status and state, 23 states enacted no evidence-based bills and 29 states enacted at least 1 bill. Only 3 states (AR, FL, and MS) enacted 4 or more evidence-based bills enacted.

**DISCUSSION**

The total number of PE bills introduced and the increase in the number of bills over time is a positive trend, yet patterns in evidence-based PE policy are
less encouraging. This overall state PE legislation data is consistent with findings from the School Health Policies and Programs study (SHPPS), where positive changes were detected from 2000 to 2006 in the percentage of states and districts with policies and practices supporting PE instruction.8 The noticeable rise in the number of bills introduced in 2005 is likely attributable to the federal mandate (Child Nutrition and WIC Reauthorization Act of 2004) that school districts have wellness policies in place at the start of the 2007-2008 school year. Even though the mandate did not specifically address PE, many school wellness policies contain a PE component as a component of physical activity. However, the number of policies should not be interpreted as increased PE in schools. Although the number of bills may be seen as increased importance of PE, the quality of the bills is equally important. Many of the state bills were general PE bills that described the formation of wellness committees to determine PE and physical activity recommendations. Only 35% contained 1 or more evidence-based elements.

We examined the bills in this study by functions of the decision process of the policy framework. When analyzing bill content, the most frequently included evidence-based element in our study was the PE minutes, which is also an evidence-based element. Overall, 178 bills mentioned increasing PE time in schools. The number of introduced bills that promoted increasing PE is encouraging and demonstrates interest in the topic by legislators. However, only 29 of these bills were enacted. There may be interest at the state level, but lack of funding and implementation concerns may impede enactment.

Analysis of other factors included in the decision process of the policy sciences framework was discouraging. Of the 163 state bills that were enacted, only 37 included provisions for assets or funding. Complex plans for PE improvement without funding are less likely to be effective. Another important factor was control intent. Oversight and evaluation are important aspects of quality legislation and part of the sanctions or penalties function of the decision process. If a bill fails to identify an entity to oversee the bill activities, the likelihood of those activities being completed is compromised. Although 493 of the bills contained factors related to oversight, only 172 of the bills contained an element of evaluation. Without evaluation, the effectiveness of the bill cannot be measured.

This study brings to light some gaps in PE legislation and provides an opportunity to further explore multilevel factors that predict bill quality and enactment. In a study on state policy and childhood obesity, Boehmer and colleagues found that bill-level factors such as sponsorship and introduction in the senate were more influential on policy enactment than state-level factors such as sociodemographics and political characteristics.22 Replicating this study focusing on PE bills would provide policy makers and practitioners with strategies to develop more politically feasible policies and help identify modifiable bill characteristics that might improve bill enactment.22

Researchers and practitioners have an opportunity to promote evidence-based PE elements to legislators. Communicating with policy makers can be an effective way to influence the inclusion of evidence-based components in state legislation.23 In studies on how state policy makers receive and use information, researchers found that policy makers should be made aware of relevant evidence through easy access to and understandable information. This information should include examples within the state of effective programs that incorporate evidence-based health promotion.24,25 For PE, policy makers should be encouraged to rely on NASPE standards, Community Guide recommendations, and other research on the effectiveness of PE on youth health.

Limitations

It is important to consider the findings of this study in context and report study limitations. Our search was developed to capture a comprehensive list of bills based on key search terms. In spite of this, some bills may have been missed (e.g., bills with terms or combinations of terms not in our search string). Additionally, appropriations bills that included already-codified programs may use section or program numbers from previous legislation instead of the terms for which we searched. However, by using expert input in developing the search terms, using bills from a 7-year period, and searching 2 databases, we compiled a very broad list of bills for analysis.

Also, comparing legislation by state can be difficult due to differences in state school board influence. In many states, the school board has responsibility for rulemaking or development of regulations that may include standards or requirements for school settings. Even though there may not be state law, school board regulations are often considered to be requirements. This is a topic for future research. Another limitation is that this study did not examine legislation in the context of existing state law. In other words, there may be some states that did not introduce bills to increase the number of minutes of PE because they already require sufficient time for PE. Thus the absence of legislation during this time period cannot be taken as an inventory of current state policy.2 This analysis was based on legislative action during the study period and cannot definitely say what PE elements exists in each state due to the lack of a statutory component. This is a subject for future research.

In spite of these limitations, this study is unique in that we evaluated state PE legislation not only by frequency, but also by the inclusion of evidence-based
elements. In doing so, we identified an opportunity to develop model PE legislation. Additionally, we developed methodology for bill abstraction and analysis that can be used with topics that involve state policy such as nutrition. Findings from this study have the potential to provide practical guidance to those in PE policy development.

**IMPLICATIONS FOR SCHOOL HEALTH**

Schools can gain guidance and funding for effective PE programs through state legislation. In order to increase the quality of PE legislation, the following recommendations are made:

1. PE legislation should include evidence-based elements, funding, oversight, and evaluation in order to improve PE in schools.
2. School representatives, policy makers, practitioners, and researchers should collaborate to formulate the best examples of evidence-based legislation.
3. “Model” legislation has been developed for numerous other public health topics. Simpler model language may be helpful in promoting effective PE programs in schools.
4. School representatives, practitioners, and researchers should develop ways to enhance communication with policy makers to share the model evidence-based PE legislation.
5. Promoting evidence-based PE policy should be an ongoing effort. Increased awareness over time may foster a positive change in priority focus for policy makers.

**Human Subjects Approval Statement**

Institutional review board administrator at Washington University in St. Louis determined the study to be exempt.

**REFERENCES**