



Evidence-based policies on school nutrition and physical education: Associations with state-level collaboration, obesity, and socio-economic indicators



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ABSTRACT

Despite calls for more cross-sector collaboration on obesity prevention, little is known about the role of collaborative partnerships, or groups of organizations from different sectors working together toward a shared goal, in state policy activities. This study examined associations between competitive food/beverage and physical education policies and state-level collaboration and state characteristics (obesity, socioeconomic indicators, public health funding levels) for all 50 states and the District of Columbia, USA, in 2012. We examined cross-sectional associations between evidence-based competitive food/beverage and physical education policies from the Classification of Laws Associated with School Students and state characteristics from the School Health Policies and Practices Study and other national data sources using prevalence ratios and generalized linear models. Analyses were conducted in 2016. Cross-sector collaboration (i.e., state staff reports of working together on school nutrition or physical education activities) between state-level nutrition and physical education staff and ten types of organizations was not significantly associated with having state policies. Childhood obesity (RR = 1.78, 95% CI[1.11,2.85]), high-school non-completion (RR = 2.35, 95% CI[1.36,4.06]), poverty (RR = 1.89, 95% CI[1.16,3.09]) and proportion non-white or Hispanic residents (RR = 1.75, 95% CI[1.07, 2.85]) were positively associated with the presence of elementary school competitive food/beverage policies. Fewer indicators were associated with policies for middle and high schools. The large investment of time and resources required for cross-sector collaboration demands greater research evidence on how to structure and manage collaborative partnerships for the greatest impact.

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1. Introduction

A primary goal of public health collaborative partnerships is to develop and support policies that improve population health, yet not all policies are equally effective in achieving this goal. There is increasing evidence that specific environmental strategies and policies, particularly in school settings, may lead to improvements in diet, physical activity, and weight. State policies mandating specific nutrition standards for competitive foods/beverages (CF) in various school venues have been linked to reduced availability of prohibited items, reduced in-school consumption of prohibited items, and healthier in-school dietary intake, though evidence has been mixed on their relationship to obesity

(Chriqui et al., 2014; Hennessy et al., 2014). In addition, state policies that require a specific, minimum amount of time spent in physical education (PE) may increase schools' provision of PE (Perna et al., 2012), increase PE attendance and activity (Taber et al., 2013), and reduce obesity risk (Cawley et al., 2013).

However, little is known about state-level factors associated with enactment of the above evidence-based policies. Nearly all studies examining correlates of state policy do not distinguish between stronger policies with specific, mandated standards, such as those above, and weaker policies that contain only recommendations or vague wording (Eyler et al., 2012; Boehmer et al., 2008; Cawley and Liu, 2008; Hersey et al., 2010; Marlow, 2013), which have generally not been shown to be effective (Taber et al., 2013; Riis et al., 2012). Only one study examined correlates of specific, mandated state-level PE policies, and found that states with higher poverty rates and other markers of socioeconomic disadvantage were more likely to enact such policies compared to more advantaged states (Monnat et al., 2014).

Another factor that could influence states' policy environment is the work of collaborative partnerships, or groups of organizations from

Abbreviations: CF, competitive foods/beverages; PE, physical education; SHPPS, School Health Policies and Practices Study; SHAPE, Society of Health and Physical Educators.

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different sectors working together toward a shared goal. Despite calls from the National Academy of Medicine and other leading scientific authorities for more cross-sector collaboration on obesity prevention (Institute of Medicine, 2012), no studies to date have examined whether features of state-level collaborative partnerships are associated with the presence of empirically supported obesity prevention policies. Theory and practice of collaborative partnerships suggest that several structural and functional features of partnerships impact their effectiveness (Baker et al., 2012; Retrum et al., 2013). For example, partnerships that include organizational members with advocacy-oriented missions and expertise may be able to engage in a wider range of direct advocacy and lobbying activities than partnerships without this representation. Conversely, some obesity prevention leaders have expressed concerns about engaging members of the food and beverage industry as partners in nutrition- and obesity-related collaboration in light of potential financial conflicts of interest the industry may have in reducing consumption of some products (Institute of Medicine, 2012). Recent research has likewise found that non-profit organizations and public health agencies are the most trusted by other members of community health partnerships, while employer and business groups are less trusted (Hogg and Varda, 2016).

Only one prior study has evaluated the relationship between statewide obesity prevention partnerships and state policy change. Hersey et al. found that states receiving funding from the Centers for Disease Control and Prevention (CDC)'s Nutrition, Physical Activity, and Obesity program enacted more obesity-related state legislation than states without funding (Hersey et al., 2010). Furthermore, states with high partnership involvement implemented four times as many local policies as states with low partnership involvement (Hersey et al., 2012). Other research has found that the number of organization types collaborating on physical education activities at the state level increased over the past decade, and greater collaboration was positively associated with childhood obesity, poverty and public health funding (Pelletier et al., 2016).

The aim of this study was to examine associations between the presence of evidence-based CF and PE state policies and statewide collaboration on school nutrition and PE activities with specific types of organizations measured on a national survey (state-level school health staff, health-focused non-profit organizations, businesses, and state departments of parks/recreation), state-level childhood obesity prevalence, socio-economic indicators, and public health funding levels in 2012. Collaboration with more types of state-level school health staff and non-profit organizations was hypothesized to be positively associated with enacted evidence-based CF and PE policies in 2012, while collaboration with businesses was hypothesized to be negatively associated with these policies. Greater childhood obesity prevalence, socio-economic disadvantage, political party in power in state government, and public health funding were also hypothesized to be positively associated with CF and PE policies. This study contributes to the literature on collaborative partnerships for obesity prevention policy in two ways: it is the first study to examine the association between collaboration with specific types of organizational partners and state policy outcomes, and it is among the first to examine state-level correlates of specific policies associated with child behavior and weight.

2. Methods

2.1. Policy scores

The Classification of Laws Associated with School Students is a scoring system developed by the National Cancer Institute that evaluates how closely state laws align with national standards and recommendations for school nutrition and PE (Masse et al., 2007). A score of 0 indicates no codified law; 1 indicates a law that recommends but does not require any action; 2 indicates mandated action with nonspecific

requirements (e.g., “healthy” foods/beverages); and scores >2 indicate mandated, specific actions. Scores reflect codified laws in effect as of December 31, 2012 for all 50 states and the District of Columbia (hereafter referred to as “states”). This study used updated scores for 2012 laws, which include revised methodology for scoring some variables, released in January 2016 (National Cancer Institute, 2016).

Consistent with prior literature (Hennessy et al., 2014; Taber et al., 2012), scores from six policy areas (nutrition standards for a la carte foods and beverages, respectively, in cafeterias, foods and beverages in vending machines, and foods and beverages in school stores and canteens) were averaged into one CF score for each grade level (elementary, middle, and high school). These six scores had high internal consistency (Cronbach's alpha = 0.98), reflecting that most states had a common set of standards across all in-school locations. States' PE score reflected one policy measure on mandated minimum time requirements for PE at elementary, middle, and high school. The primary outcome was whether a state had codified laws with specific, mandated requirements (average CF or PE score > 2, hereafter, “strong policies”) at each grade level.

2.2. Collaboration measures

State-level collaboration was measured using data from the nutrition services and physical activity questionnaires in the School Health Policies and Practices Study (SHPPS), a national survey administered to officials in all states by the CDC in 2012 (Centers for Disease Control and Prevention, 2013). Respondents to the nutrition services questionnaire were state-level directors, commissioners, or consultants for school nutrition services. Respondents to the physical activity questionnaire were state-level directors, specialists, or consultants for health and PE.

A series of questions asked whether state-level child nutrition or food service staff worked on various school food service or nutrition activities during the past 12 months with staff or members from different types of organizations. A similar series in the physical activity questionnaire asked whether state-level PE staff worked on PE activities during the past 12 months with various organization types. Response options were yes, no, or no state level staff in this area (for state-level staff questions only). Representatives from six states did not answer at least one question in the series, resulting in missing data for those questions. Responses were coded 1 = yes and 0 = no/no state level staff/no answer because lack of staff precluded collaboration with that sector and non-response suggested that the respondent was unsure or unaware of collaboration with that organization type.

This study examines collaboration with five types of state-level school health staff; staff or members from five types of health-focused non-profit and professional organizations; staff or members of businesses; and staff or members of the state department of parks or recreation (asked on physical activity questionnaire only).

Organization types with conceptually similar roles were combined into two summary measures. School health staff included health education, health services, mental health or social services, and either PE or school nutrition staff, for a theoretical maximum score of four for either school nutrition or PE activities (school nutrition staff reported collaboration with PE staff on nutrition activities and PE staff reported collaboration with school nutrition staff on PE activities). Health-focused non-profit organizations included a state-level health organization, such as the American Heart Association or the American Cancer Society; Action for Healthy Kids; a state-level school nurses' association; a state-level physician's organization, such as the American Academy of Pediatrics; and the Governor's Council on Physical Fitness and Sports (on the physical activity questionnaire only), for a theoretical maximum score of four for school nutrition activities and five for PE activities. Collaboration with businesses and parks/recreation departments were examined

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